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Going “Distress” on the WACC: Theoretical and Empirical Analysis

Submitted for the degree of Doctor of Philosophy

ABSTRACT

WACC has traditionally been used as a measure of the cost of capital for companies and as a discount rate of the future company's cash flows for valuation purposes. The WACC, especially for "distressed" companies, can play a key role in determining the efficiency of the restructuring framework for companies heading into bankruptcy. The theory and the practice show that companies that file for Chapter 11 have a higher probability of rehabilitation as a going concern and boost the recovery of the stakeholders as a whole than more credit friendly restructuring frameworks. Additionally, rehabilitated companies from more debtor friendly proceedings that have undergone a profound restructuring through efficient tools should also enjoy a higher probability of survival. In the first part of the thesis, we aim to prove that empirically by thoroughly looking at the market based WACC of a sample of American and European companies one year before and after the filing date. If we meet with success, then we should be confident that the WACC could result in a powerful tool to evaluate the efficiency of the restructuring framework of the company's filing.

In the second part, we look at the impact of Basel III on the banks and their capital structure. We discuss that the implementation of Basel III will turn the focus of banks towards the WACC rather than ROE due to overall increase in the cost of capital. Banks have traditionally enjoyed "cheap" funding due to the systematic support from the governments. Basel III advocates for a capital structure "bail-in" rather that "bail-out" coupled with higher capital requirements will make the achievement of high ROEs a difficult task. We compare the WACC under Basel II and Basel III frameworks and we draw some conclusions.

We then focus on the CoCo, a debt like contingent capital instruments that converts into equity upon a credit event. The existence of the CoCo will boost the overall WACC due to its higher price as a result of its loss absorbing features. We conduct a theoretical and empirical model to evaluate the impact of the CoCos on the WACC on a pre and post conversion basis and the implications for the equity holders who have traditionally enjoy higher ROEs with low COEs and hence constant equity multiple expansion. Here, again, we expect to prove the useful role of the WACC in "distress" to suggest the optimal capital structure for banks.

In summary, we attempt to genuinely contribute to the vast literature of the cost of capital, theoretically and empirically, by “coining” the expression “Going Distress on WACC”.

KEY WORDS

WACC, solvency, restructuring, bail-in/out, Basel III, CoCo, capital structure.

DECLARATION

This is to certify that

(i) the thesis comprises only my original work towards the PhD.

(ii) due acknowledgement has been made in the text to all other material used, .

(iii) the thesis has 56,527 words in length, exclusive of tables, maps, bibliographies and appendices.

Jorge Martín Cerón

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London, 20th Jan 2012

[1] And through every single step of our innumerable strolls around the stunning city of Bruges during my Master in Economics.

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SECTION 1 – THE THEORETICAL FRAMEWORK FOR THE COST OF REGULATORY CAPITA AND CoCos.

INTRODUCTION

The analysis of the average weighted cost of capital (WACC) has traditionally delivered an in depth theoretical and empirical models by well-known academics and researchers which have mainly focused on companies or securities valuation, or otherwise as a key element within the capital structure and cost of funding literature. The WACC plays a role in the former as a discount rate to estimate the future cash flows of a company and set a fair price of its intrinsic value. The WACC in the latter assesses the cost of the different sources of capital of a company to optimize the capital structure and the cost of funding. As the WACC can be estimated using book values (balance sheet and profit and loss account numbers) or market values by looking at the market price of the equity and debt, the analysis of the WACC becomes more relevant for financial "distressed" companies due to the significant differences between the value of the funding sources booked in the balance sheet and their market price. This is due to the impairments and recovery value assigned by equity and debt holders to their instruments in a restructuring / liquidation scenario not only based on the fundamental recovery for the security holders but on the efficiency of the regulatory restructuring framework of the company's filing

As a consequence, we can envisage a third role for the WACC as a measure of the efficiency of the restructuring proceeding where the company could file for bankruptcy should liquidity, solvency or funding prompted a corporate rehabilitation. To do so, we look at the main corporate restructuring proceedings in US and Western Europe and through a sample of public companies that filed for bankruptcy between 2000-2009, we estimate the WACC at market prices to dwell on the WACC's ability to capture the efficiency of the restructuring framework. In theory, on a pre-restructuring basis, all things equal, companies in countries with debtor friendly restructuring proceedings that enjoy powerful tools for the company rehabilitation should command lower WACC than those in more creditor friendly countries which are more prone to look out for the secured creditors rights rather than looking after the company and the rest of the security holders ("junior" and equity holders). This is due to the higher expected recovery of the entire capital structure and the preservation of company's value. Likewise, on a post restructuring basis and all things being equal, a company emerging from a debtor friendly proceeding should have a lower WACC than those of more creditor friendly ones due to the high expected recovery for the capital structure in the future owing to the well-established and proven restructuring tools implemented in the company that guarantees its future viability.

In the second part of the thesis we evaluate the impact that the new Basel III rules has on the WACC of the banks. Basel III rules seeks to shore up the capital in the banks to avoid another meltdown of the financial system that we was witnessed over the course of 2008. It seeks to bolster solvency at the banks by making the capital structure more loss absorbing beyond the equity, which will also have to be raised from current levels. The new debt instruments will have to contain loss absorbing features to withstand future losses ("bail-in") to avoid the need to resort to the taxpayer’s money ("bail-out") as it occurred during the 2008 financial turmoil. By doing so, the WACC of the banks will rise given the need to hold more equity as well as Basel III compliant instruments, whose cost will be higher as a result of the loss absorbing characteristics . We assume these instruments can display CoCo (Contingent Convertible")'s features like that issued by Credit Suisse early 2011. We first aim to estimate the WACC of the banks pre and post Basel III to evaluate the change in cost of capital for the banks. In a second step, we turn the WACC into a "distressed WACC" by assuming mounting losses that trigger the CoCo's conversion into equity driving up the WACC.

In summary, we aim to genuinely contribute to the comprehensive theoretical and empirical literature with two new topics: the theory of the efficiency of the "distressed WACC" and the impact of the new Basel III capital structure and its consequences on a "distressed WACC" scenario.

BLOCK 1

SECTION 1

World global credit markets have experienced a major change over the last two decades. Desintermediation have brought new products, investors, structures and regulation altogether which has impacted the way companies funds themselves. Investors are now required to understand the bankruptcy regime in which they are involved when they invest in a company. Thus, this first section aims to "flesh out" the key features of the main regimes in both United States and Europe and to compare providing the theoretical underpinnings which we will use in the next two parts of the thesis.

This section splits into three parts. The first part explains in detail the concept of *corporate default* including a roadmap for the generic insolvency procedure; the concept of recovery rate in which we lay out the typical financing securities and collaterals, the subordination and some of other key features, and lastly the concept of event of default that will lead the company into either a restructuring or liquidation.

In the second part we focus on each individual bankruptcy regime including US, Germany, UK and Wales, France, Italy, Spain and Ireland. The comprehensive description of each regime will enable us to understand the finding and conclusions of the third section of this chapter in this thesis in which we will analytically compare the efficiency of the insolvency procedures in terms of the cost of capital between the US regimes and the main Western European bankruptcy codes. In this part, we will review the main law, the different existing securities, the pre insolvency proceeding, the insolvency code that breaks down into the restructuring and the liquidation law, and finally the order of payment in the event of a default. This second part also covers the so called "forum shopping" that occurs when company move their COMI (Centre of Main Interest) amongst different countries to benefit from the special features of the local bankruptcy.

In the third section, we select the main features of the insolvency law in terms of rehabilitation and liquidation. This summary will allow us to identify which regimes are more creditor or debtor friendly, which are more likely to facilitate the rehabilitation or trigger the liquidation and which are more likely to boost the recovery rate of the investors. This theoretical framework coupled with the output from the empirical project will allow us to draw some conclusions over the absolute and relative value of the cost of capital between American and European distressed companies and ascertain the ability of the WACC to capture the efficiency of the restructuring proceedings[2].

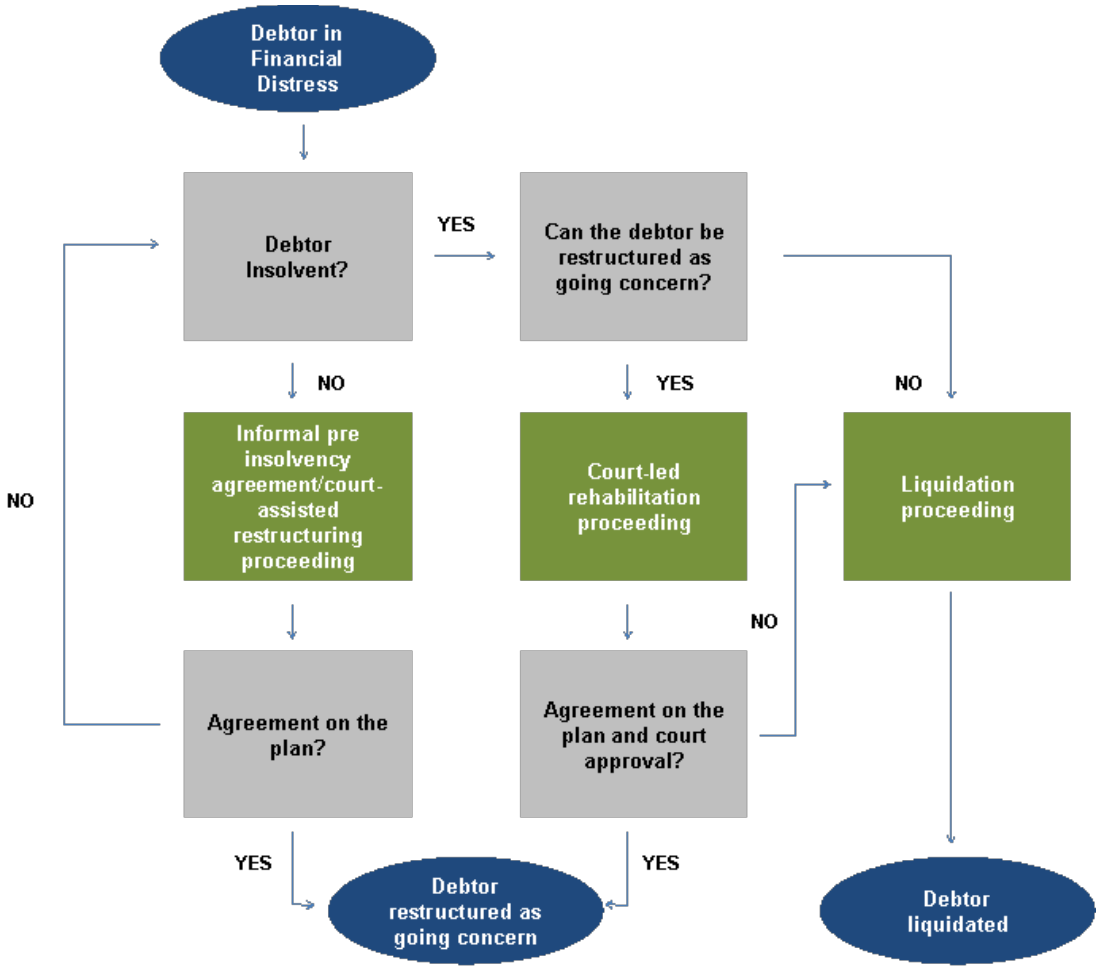
We thank again Nomura's distress and fixed income team for their contribution in terms of literature and their valuable time and inputs from my interviews with their Restructuring Legal team.

1. Generic insolvency procedure

Before discussing in depth the main US and European insolvency law regimes, we establish a standard template for the insolvency procedure to enable the reader to grasp the main concepts of a distressed situation.

[2] See Section 3.

Figure 1: Generic Insolvency Procedure



Source: Nomura (2010); author analysis

The first stage begins with the company in financial distress which can be insolvent or not. Each jurisdiction has its own insolvency definition. In some cases it is just a suspension of payments (the company cannot meet any of its financial obligations as they come due), a balance sheet test (negative net asset value) or in some other regimes there is a third test whereby the management is confident the company could be insolvent in the near term.

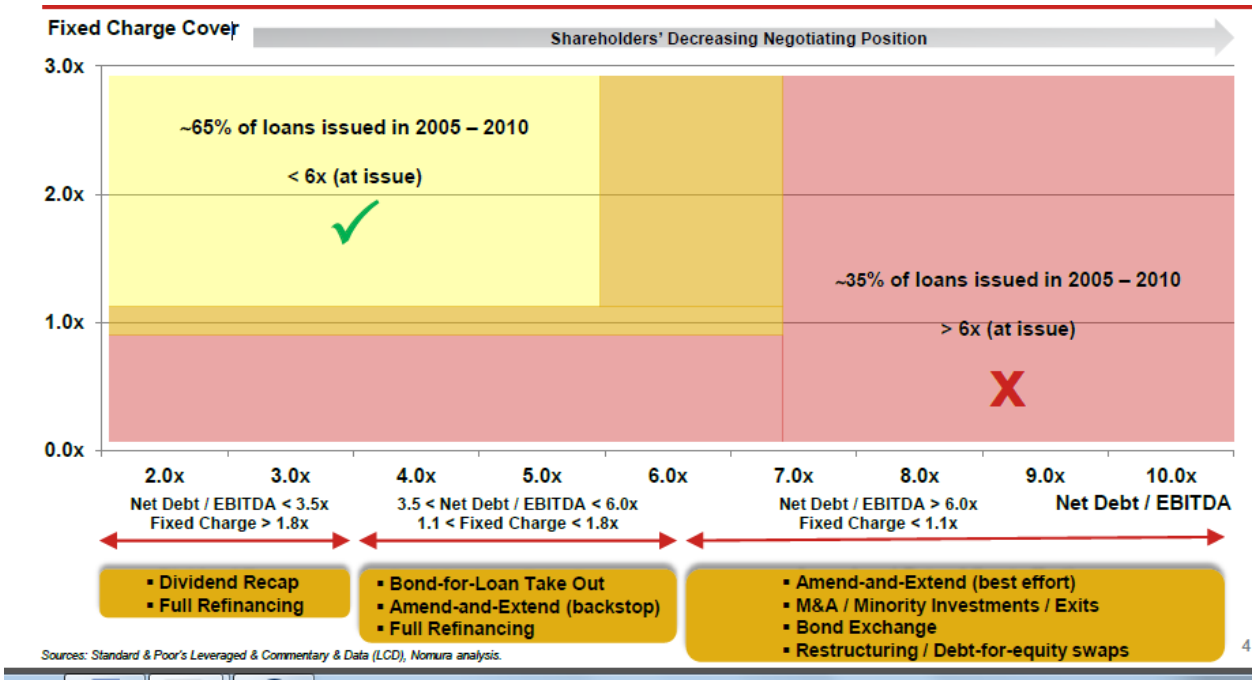
Sometimes the company is facing financial difficulties but is still solvent and thus management is not required to apply for any insolvency procedure (however some jurisdictions allow the company to enter a formal insolvency procedure). The company and its creditors are allowed to conduct an informal/out of the court process to carry out a liability exercise to fix the capital structure using a standstill or forbearance agreement. The "*sine qua non*" condition is that the company reaches an agreement with all creditors which might turn out to be challenging under a debt structure with several lenders' classes (senior and junior). Moreover, entering in restructuring exercises could trigger an event of default under several debt agreements.

There is no clear cut path leading to insolvency, let alone the involving issues that gives rise the distressed event. Management can envisage that the insolvency is looming and uses valuable cash reserves to meet its financial obligations to conceal the reality from financial and trade creditors. In some jurisdictions, there is no requirement for an insolvent company to apply for an insolvency procedure. However, as a general rule, and in order to protect the interests of the creditors, an insolvent company is obliged to file for an insolvency proceeding or management can face personal liabilities (Altman 1984).

Once the company has entered the insolvency process, it boils down to either pursue a restructuring as a going concern or face liquidation. This is not an obvious issue and in most cases it has to be gauged by an external party, either the court or an independent insolvency practitioner. The external party will liaise with the company, creditors and shareholders to come up with a plan to evaluate the viability of the company and to ascertain whether the company is worth more as a going concern (restructuring) or as a gone concern (winding up). The latter will entail the entire asset disposal and the use the proceeds to repay the stakeholders (Moyer 2005).

The reader must keep in mind that any "overlevered" firm has to undergo a debt refinancing at some stage in their business cycle. The optimal refinancing solution will need to be tailored to the companies' financial situation as well as to shareholders' plan/exit horizon. However, an "overlevered" but viable firm with a weak cash flow generation capacity, poor capital structure and solvency and a challenging business outlook has to go through a restructuring or otherwise face the inevitable liquidation. Below an overview of alternative refinancing / term out solutions for levered companies in terms of the leverage ratio (Net Debt / Ebitda) and fixed charge cover (free cash flow before debt service). As we observe, at some point, a restructuring/debt for equity swaps is just inevitable to overhaul the capital structure and bring leverage down. The Red Cross marks the areas where our sample of companies in section 3 lies in.

Figure 2: Alternative refinancing/term out solutions



Source: Standard & Poor's Leveraged & Commentary & Data; Nomura analysis

We distinguish between liquidation/winding up and a restructuring/rehabilitation proceeding

1.1 Liquidation proceedings

When there is no viable plan for the company to emerge from insolvency, the company is liquidated. The goal is to dispose the assets and distribute the proceeds in line with the APR (Absolute Priority Rule).[3] The liquidation procedure can be initiated by either the company or by any of the creditors that proves the company to be insolvent. If the court approves the plan, then an insolvency practitioner is appointed to set about the liquidation procedure. Management is consequently removed and the liquidator initiates the asset disposal. Proceeds are distributed. The senior creditors receive the proceeds form the secured assets whilst the unsecured are left with the remaining proceeds until they are exhausted (Nomura 2010).

In some instance, a solvent debtor can apply for liquidation (voluntary winding up). This is something common between companies that were set up to fulfill a mission. Once it has been accomplished, management has to prove the company is solvent and all creditors receive par. If management fails to do so, then creditors take over the company and it is liquidated under a standard procedure.

In some markets, the APR rule is sometimes unobserved. This could happen if the law contemplates that out of the money equity holders and employees are stakeholders in a company and have some residual rights. Another common APR violation is the provision of "insolvency puts" to out of the money creditors or shareholders allowing them to delay the procedure or harm the in the money stakeholders. To discourage them from exercising that put, out of the money investors are provided with some financial compensation and thus violating the APR (O'Kane 2010).

1.2 Restructuring proceedings

Generally speaking, the shorter the corporate restructuring is delayed the lower the risk of value destruction in the company as cash is not depleted, valuable assets badly disposed and employees and trade creditors remain within the corporate structure. Consequently, countries have implemented rehabilitation or restructuring procedures to enable the company to avoid liquidation and remain as a going concern.

In many jurisdictions, solvent companies facing financial headwinds are allowed to apply for a restructuring proceeding to encourage quick action before the company becomes insolvent. The most common features are voluntary and involuntary restructuring, a stay on any security enforcement by creditors, court supervision, insolvency financing with super senior status or the need of majority vote on the restructuring plan. Let us briefly go over them.

The first step of a restructuring procedure can be voluntary (by the company) or involuntary (by creditors). The latter case can be contested by the company and the dispute is settled in court. The main advantage of the involuntary filing is that incentives creditors and management to engage in discussions. Furthermore, unsecured creditors can also resort to it in order to benefit from a stay on secured creditors as the sale or seizure of assets that might undermine their future recovery in liquidation.

[3] The APR dictates that a creditor cannot be reimbursed until all more senior creditors have been fully repaid.

The *stay* is one of the key features and it enhances the success of the company rehabilitation as it gives room to the different parties to hammer out an agreement before the secured creditors enforce their securities. It also deters trade creditors from collecting their overdue payables or leaving the company for good and thus, jeopardising any restructuring plan.

Some restructuring proceedings allow management to stay in the firm over the process to avoid any disruption, but it is subject to creditors 'approval. Some others remove management immediately. Even if the management remain in the company, the process may be court-supervised and it varies in every jurisdiction. An insolvency practitioner is usually appointed to engage with management and creditors to clinch an agreement. Court approval is usually mandatory for particular transactions that fall outside the ordinary business of the company.

Some insolvency proceedings allow some sort of post insolvency financing which is granted with a preferential status under the APR. This new money is a key feature for a successful rehabilitation to prop up the current business whilst the restructuring is underway. Given the risk of these loans, these new creditors are granted with a level of seniority of at least the same as that of the secured creditors.

Current or new management have to produce and deliver a restructuring plan within a time horizon. This plan has to be approved by creditors and (sometime by the equity holders) in the creditors' committee. Secured creditors are sometimes left out as long as they receive full recovery. Some jurisdictions allow the setting up of different creditor classes to deal with the specifics of each class so that they can express their own view on the agreement and vote accordingly. The pursuit of a agreement may become difficult when there are cross holding investors in different debt securities or credit derivatives to hedge positions[4].

It is quite common to see jurisdictions with different voting thresholds for the restructuring plan approval. Most jurisdictions require a simple majority of creditors in number and value but some others require 66.6% or even 75%. Once the plan is approved it becomes binding to all creditors including the dissenting ones (Nomura 2010).

When an insolvent company enters into a restructuring plan, equity holders are *out of the money* (as the economic value of the company is less than the value of the debt). The value of the company "breaks" at a particular level of debt (the "fulcrum creditors). Those creditors fallen below are considered *out the money*. In theory, only *in the money* creditors should be allowed to vote but some jurisdictions view equity holders and employees as stakeholders and might have a say on the restructuring plan.

Some jurisdictions include a cramdown on dissenting creditors meaning that a veto on the plan by these creditors can be overridden. This is meant to prevent some creditors from undermining a potential restructuring plan. Once the plan is approved, the company emerges as going concern, with a revised capital structure and with a viable long term business. If the restructuring plan fails, the company is usually put into a liquidation process. In some instance in which the jurisdiction does not provide for all

[4] The most common one are the CDS (Credit Default Swaps) which are meant to hedge the bondholders' exposure (bonds) in the company. The CDS is a credit derivative insurance product whereby if the company defaults the insurance seller reimburses the former at par.

these enhancing features and creditors view the insolvency framework as value destructive (as a result of low expertise of the court, speed of the proceeding etc), creditors could pursue an out of the court agreement or even move their centre of main interest to another more favourable jurisdiction. It must be noted also that the cost of a restructuring are usually high (fees of lawyers, court etc) and usually rank first in the APR. The amount of fees is subject to the size and duration of the case and can detrimentally affect creditor's recovery. One quick and efficient way to save on these fees is a through a pre pack restructuring plan where debtor and creditors agree a plan before the insolvency filing (Scarberry 1996).

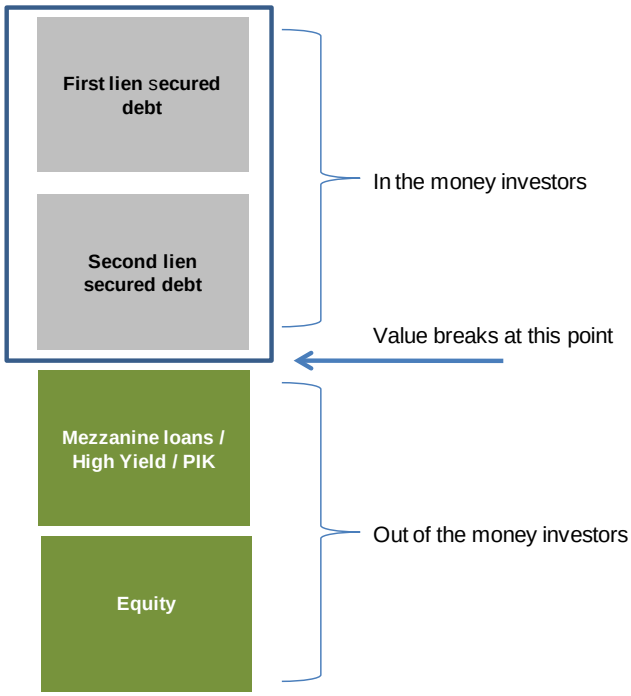
2. Recovery rate

In the third section of this chapter, we go about estimating the WACC pre and post insolvency to assess the efficiency of the insolvency framework or in other words, the estimated recovery rate of the investors in distressed companies. But how is the recovery rate defined? There are several well established definitions. For example, Moody's defines it as the price of the debt from a defaulted company approximately 30 days after the default event. The CDS market defines it as the price given in an auction of a company that has triggered a credit event. For distressed debt investors, it is regarded as what they receive in an insolvency proceeding which can be either liquidation or restructuring. Therefore, as the debt might experience haircuts or maturity rescheduling, the final outcome is not easily predictable.

It must be noted that the bond price post default is sometimes not too accurate to account for the final recovery rate as a result of some market technical factors. This is due to the fact that some of the debt holders sell their debt to distressed debt specialists and thus the price is driven by the expected future workout price and the volume of distressed debt outstanding. According to Nomura, this could be a reason why the average recovery rate (as the average price of defaulted bonds 30 days after the credit event) usually decreases as macroeconomic defaults rates increase. In other words, distressed debt investors are short of funds to purchase all the distressed debt and consequently prices fall (Frank 1992).

To estimate the debt recovery rate, one has to have a clear view on the company's valuation. Once the company's value is set at a price, then factors such as debt priority, subordination, enforcement rights and collateral will determine the final debt valuation. Once the valuation work is done, we must determine where the value breaks in the capital structure to estimate the recovery rate of each single debt tranche. The type of debt where creditors get less than parity is called "fulcrum security". It is actually the security at which the value breaks in the capital structure. All debt holders of this security are ranked pari passu hence all receive the same amount. This is the starting point for any rehabilitation exercise as it enables to determine which creditors are in the money and therefore should be asked over the restructuring process.

Figure 3: Value Breaks in the Capital Structure



Source: author

A "must be" in every single distressed situation is that if a company is worth more as a going concern than in a liquidation scenario, the company should have the chance to be restructured to maximise the recovery rate of the creditors. By all means, in a restructuring process, conflicts will rise between *in and out of the money* creditors and shareholders concerning the distribution of the economics interests of the debtor. This involves the engagement between the creditors, management and the court to envisage the most viable restructuring plan for the debtor. One of the most efficient methods to set the "breaking" point in the capital structure is through an auction of the company's assets as a going concern. The potential buyers carry out their own due diligence on their assets which helps to estimate the value of the assets and hence where the value breaks in the capital structure (Nomura 2010).

There are usually two useful approaches that are deemed to be superior to any company breakdown exercise or collateral's disposal:

- *Debtor in Possession common* in the US Chapter 11 allowing management (and sometimes shareholders) to remain in control of the debtor to help through the restructuring process.

- *Debt for equity swaps and debt forgiveness* where the impaired creditors swap some of its claims into equity of the debtor helping the company's recapitalisation and the agreement on the debt haircuts.

2.1 Security

Creditors usually demand some sort of collateral to provide financing to a company. This security allows creditors to seize and sell this collateral up to the value of their debt. This security can take the form of a property, cash, inventory, equipment and so on. Generally speaking, these assets can take two forms: immovables (real estate) or movables (anything else).

Following Nomura (2010), broadly speaking, jurisdictions usually provide for some legal devices that grant rights over assets to creditors. The most common ones are:

Security	Description
Legal Mortgage	Automatic transfer of the company's asset to the creditor in an event of default.
Pledge	Creditor receives the company's asset and keeps it until debt is paid off.
Lien	Right to possess someone's property until that person carries out a particular obligation. It is different from a pledge as the asset here is transferred to the creditor for some other purposes (custody) and not for the purpose of the security itself.
Charge	This is the custody of an asset until the debt is paid off. There two types: floating and fixed.
Fixed charge	This is a security attached to a particular asset. The charge's holder does not hold the asset but he's is entitled to receive any proceeds from its sale. The company can only dispose the asset once the debt is reimbursed and the charge is removed.
Floating charge	It is a fixed charge but attached to a group of current of future assets (e.g inventory). If an event happens that frees up the floating charge it becomes fixed charge to the designated assets.

Source: Nomura (2010); author analysis

Creditors face the risk that the assets that secures their debt was used at a later stage to grant security on another loan. To avoid that, creditors usually demand their security to be "perfected" and this collateral to be recorded in a publicly official register[5]. However, this "perfected" security can be used to secure two different loans but it has to state the repayment seniority between both debt classes in then official registration (Rosenberg 2000).

[5] Bond indentures usually include negative pledge clauses to avoid the granting of the same security on two different loan classes.

Some jurisdictions provide for an automatic stay preventing the secured creditors from enforcing their collaterals, repossessing the assets and selling it afterwards. The stay allows the debtor to gain some time to continue its business as a going concern and achieve a restructuring plan with its creditors.

2.2 Subordination

Subordination is a key concept to understand distress valuation and the different legal frameworks. A debt class is said to be subordinated if it only receives proceedings once the senior debt are being paid in full under any default or liquidation scenario. In line with Nomura (2010), there are three ways of subordination:

2.2.1 Subordination by lien

In any liquidation, all assets are listed and valued at market prices. First lien secured creditors receive all the proceeds from the sale of the assets up to the value of their claim. If there are any remaining proceeds, second lien creditors get the balance (Nomura 2010).

Credit Documentation	Description
Credit Agreement	This is main legal piece of a loan. It lays out the size, description, currency, coupon, etc of the loan. It also states the covenants, the event of defaults and the remedies if the covenant is breached.
The Intercreditor Agreement	It sets out the relationship between first and second lien and on the other hand the mezzanine lenders. It also includes the security trustee provisions between all lenders.
The Collateral Trust Agreement	For secured debt, this agreement sets out natures of the assets used as collaterals as well as the rights and obligations between the parties.
Security documents	They set up securities over all or some of the debtor's assets to fulfil its debt obligations.

Source: Nomura (2010); author analysis

The table above list the main type of credit documentation between creditors. It is the intercreditor agreement that govern the lien subordination between the first and second lien creditors. This is usually undertaken by stating in the documentation that second lien creditors will not interfere in the enforcement of the collateral by the first lien creditors. Moreover, the second lien creditors agree to stand still for some period after the default giving some time to first lien creditors to enforce their security[6]. Additionally, second lien usually accept that the first lien security is "perfected" for the benefit of the first lien before any

[6] If assets are to be sold, second lien lenders have to approve it.

right is granted to the second lien creditors. The intercreditor agreement may also include a US type DIP loans (Dahiya 2003). This clause might state that these new loans ranks pari passu with the secured debt.

Second lien creditors usually enjoy the right to vote on any reorganisation plan or new debt and also the granting of additional collateral to better protect their economic interest if the collateral value has decreased.

It must be noted that the interest of the secured and unsecured creditors can be misaligned. This happens when the secured creditors receive full recovery and pursue a quick sale of the asset. They will not deem necessary to hold off for a better restructuring plan if that only benefits the unsecured creditors[7].

2.2.2 Payment subordination

This type of subordination shows how the proceeds are distributed among the entire spectre of creditors according to the priority rule. It basically says that any proceed above the claim of the secured creditors are flown through to the second lien and mezzanine creditors (Gilson 2000).

The trust deed or the bond indenture is the agreement between the debtor and the bond trustee, who looks after the bondholders rights. It also governs the seniority of the bonds and how they get paid back. Each legal jurisdiction has its own framework for the priority of payments so it is necessary that all the credit documentation do not stray from this rule. Generally speaking, the ranking of creditors usually look this way:

- *Secured creditors*: these lenders have a collateral as security (immovable or movable) and are usually financial creditors but in some instances trade creditors.

- *Preferential or privileged creditors*: includes commissions paid to administrators, court fees or to insolvency professionals. Some jurisdictions include employee wages and some type of taxes.

- *Unsecured creditors*: these are creditors with no or partial security granted to their claims. They are usually financial lenders but also supplier or some employee claims.

- *Subordinated creditors*: those creditors that agreed to be repaid after the former.

2.2.3 Structural subordination

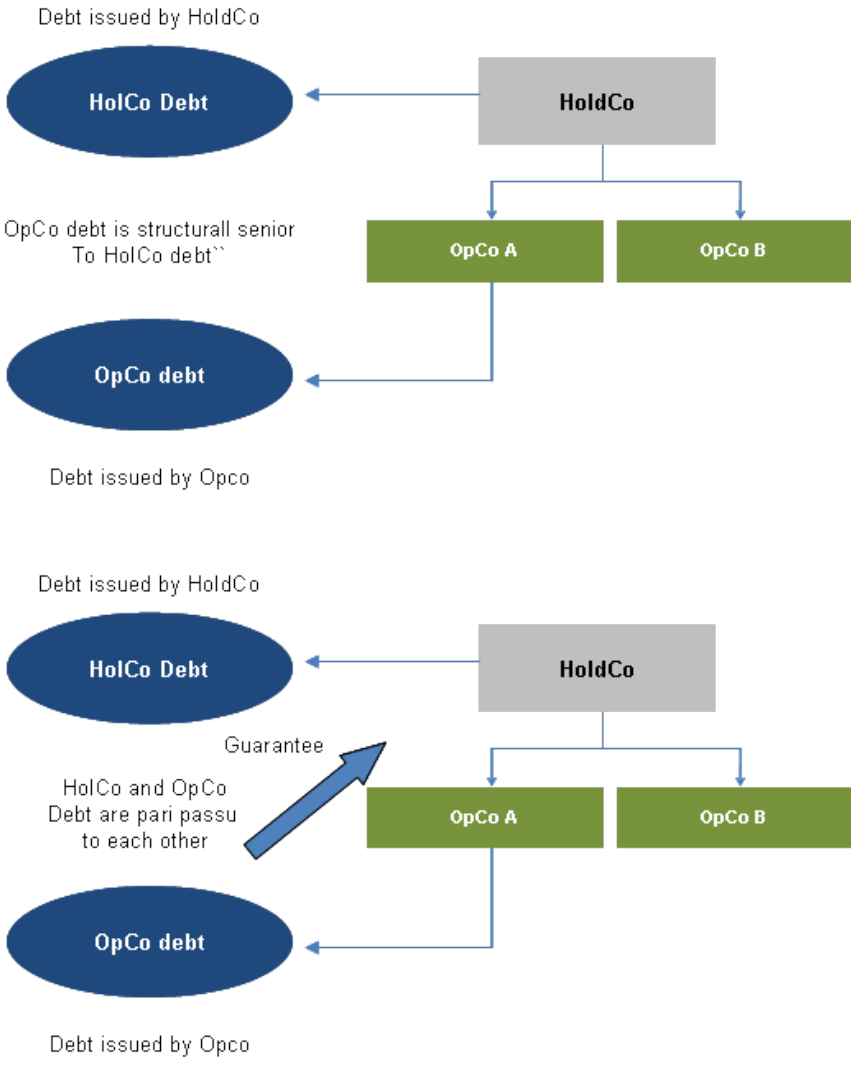
This type of subordination stems from the debt issued at different entities within the company. The typical structure comprises a holding company (HoldCo) which owns several operating companies (OpCos). These OpCos owns the main assets of the company and generates the cash flows to service the debt at

[7] A major traditional difference between the US and Europe corporate debt market where the latter is mainly represented by banks.

the HoldCo level. To some extent, the Opcos are structurally senior to HolCo as they are close to the cash and assets (Nomura 2010).

In liquidation or winding up, the effects of the structural and contractual subordination as well as the liens interplay with each other. Structural subordination looks at the proximity of the assets. Liabilities at the OpCos are paid off through the proceeds of their assets and move up the capital structure until the proceeds are used up. Certain guarantees on the OpCos assets are granted to the HolCo debt to enhance the recovery prospects in some instances and to some extent eliminate the structural subordination. These types of guarantees are called “upstream”.

Figure 4: Types of guarantees



Source: Nomura (2010); author analysis

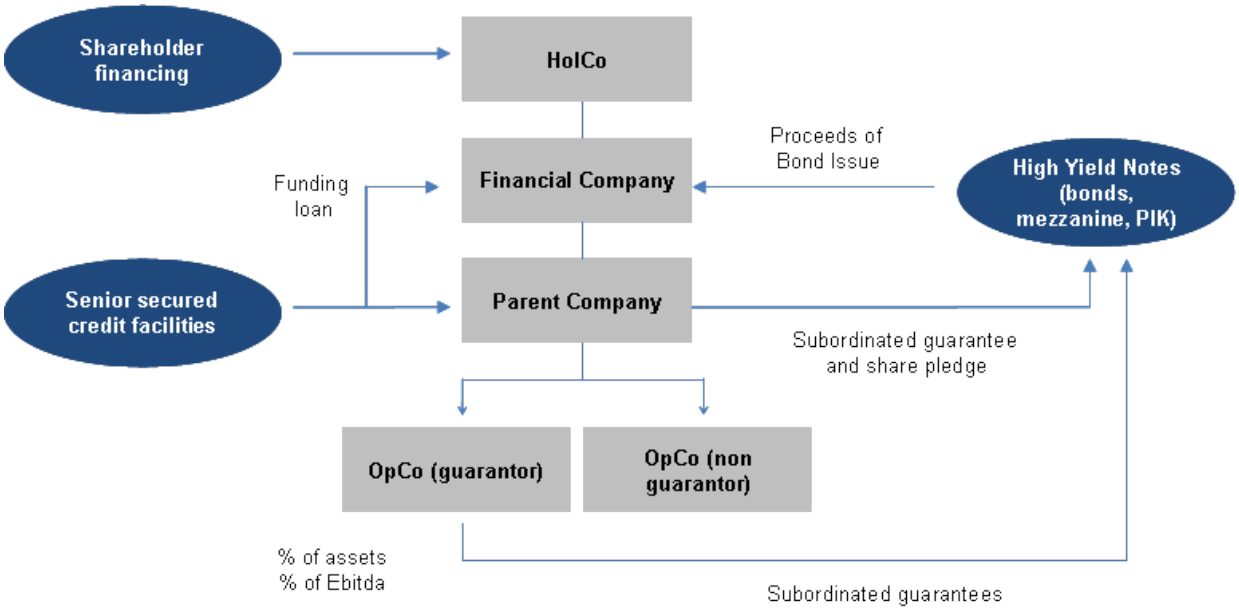
In the absence of a guarantee, debt at the OpCo is structurally senior to debt sitting at the HolCo level. With a guarantee in place, both debts are pari passu to each other and to other senior unsecured OpCo

debt. In the event of any OpCo going under, the guarantee implies that any structurally senior debt must be paid off first. Additionally, any other debt at the OpCo level (senior bank debt and trade creditors) is also paid down before any remaining proceeds is sent up to the HoldCo level.

The relevance of structural subordination depends on the jurisdictions. In US, companies issue senior secured debt with high yield bonds out of the same vehicle. Senior lenders feel comfortable that the inherently contractual subordination implied in the high yield bond documentation is enough to protect the rights of the secured creditors. In Europe is more uncommon as secured creditors fear that the insolvency regimes will bypass the priority rules and prefer the bondholders to be structurally subordinate. The bonds are then issued at the HoldCo level which are usually several steps above the OpCo debt and hence further away from the assets.

Below an example of a corporate structure that shows the structural subordination in a company. The initial equity is placed at the top and flows downwards via intercompany loans or equity injection until it gets to the parent company. Also, high yield bonds are usually issued by a finance company which also flows through to the parent company (Nomura 2010).

Figure 5: Structural Subordination



Source: Nomura (2010); author analysis

The secured debt usually sits in the parent company. Below, the operating companies which either guarantee the secured debt and leave the bondholders structurally subordinated or grant some upstream guarantees in forms of assets or operating metrics (Ebitda, Free Cash Flow, etc). Therefore the secured creditors at the parent company enjoy a stronger position than the bondholders given the subordinated nature of the guarantee. Therefore, the bondholders are structurally subordinated to the secured creditors in any liquidation/winding up.

3. Event of default

An event of default (EoD) is a situation that enables the creditor to accelerate the instrument. If the creditors decide to accelerate it, then the debt redeems at par along with the accrued interests. If the company cannot comply with that then the EoD is triggered and the company falls into a restructuring or the insolvency.

There are several type of EoD. The best known is the company's failure to pay the debt as it becomes due or the interest attached to the debt. This is called a payment default. There is usually a 5 days grace period on the interest but not on the principal to allow the company to look for alternatives to fix the problem.

The other most common trigger of EoD is the technical default or a covenant breach. These covenants are meant to instill some discipline on the company to preserve the credit quality and allow the management to take the necessary steps before the payment default occurs. The grace period in covenants is usually 30 days in loans and 14 to 28 days in bonds.

Some other EoD are the misrepresentation of the financial documentation of the company, the cease of the business activity or the sale of a subsidiary.

Once a company has incurred in a payment default on a loan or bond, there are several clauses to protect all creditors against the enforcement of securities by the first creditors that might undermine the recovery of the others creditors' classes. These clauses are meant to treat all creditors in a fair and orderly manner. The main clauses are the cross payment default, cross default or cross acceleration (Keisman D. 2006).

Cross defaults states that any EoD in a debt instrument will trigger a default and acceleration on other loans and bonds with this feature attached. Cross acceleration states that it is the acceleration of the instrument by the creditors than brings about the acceleration of other debt. This a weaker protection compared to cross default as creditors are at the expense of the affected creditors to accelerate their instruments as there are no legal obligations of the latter to trigger the EoD.

Cross default usually applies also to the subsidiaries of the company, and hence a default on the OpCos usually triggers the EoD at the HoldCo level. This situation will have to be thoroughly documented in the debt agreements (Nomura 2010).

An alternative to any acceleration is a waiver from the lenders in return for some kind of compensation to allow the company to grapple with the problem and rectify it. This waiver is usually granted provided the problem is fixable (a breach of a maintenance covenants for example). Once a waiver on an EoD has been granted, the EoD cannot be used to accelerate the debt payment any longer.

A standstill agreement is also quite common whereby a temporary suspension on acceleration rights or enforcement is granted to the company, and only creditors can accelerate once the standstill is over.

3.1 Incurrence covenants

These negative covenants restrict certain actions of the company many of which are based on financial ratios being, the most common one, the EBITDA. These covenants are only tested when the company carries out a designated action. For example, incurring in more debt (except for the permitted debt or carve out that replaces debt or adds vital debt for the debtor), purchasing another company, granting

security to other creditors (negative pledge), ability to make some capital expenditures or selling some assets. These are usually found in leveraged or high yield bonds.

3.2 Maintenance covenants

These covenants are tested periodically (usually on a quarterly basis) and are contingent on the company's performance. They are commonly based on financial ratios being the most important:

- *Leverage ratio*: Debt/Ebitda expressing how many times the debt is covered by the Ebitda.
- *Interest Coverage ratio*: Ebitda/Interest expense expressing how many times the interest are covered by the Ebitda.
- *Fixed Charge Coverage ratio*: Free Cash Flow before Debt Service/ (Debt Maturities + interests + Dividends) expressing to what extent the cash flow of the business is enough to assist the debt service.
- *Maximum capital expenditures.*
- *Tangible Net Worth and assets to liabilities.*

To some extent, a breach of a maintenance covenants implies a potential future default. Therefore, the company usually approaches to the creditors to get a waiver on the covenant breach to avoid the EoD trigger and rectify the problem. Creditor in return usually gets a higher margin on their loans/bonds. [8]

4. Bankruptcy regimes

To evaluate each bankruptcy regime it is worth setting out a list of key features to understand and compare each jurisdiction (Nomura 2010):

- *Definition of insolvency*: the concept is wide across each regime ranging from the inability to service the debt obligations, lack of liquidity or when the net asset value is negative.
- *Courts in charge of the insolvency case*: some jurisdictions have special judges with an experienced team behind to deal with insolvencies and bankruptcies.
- *Types of securities*: some regimes are characterized by dealing with different securities that grant different creditor rights, mostly on Anglo Saxo regimes with floating and fixed types of securities.
- *Creditor's rights* to bring about liquidation or restructuring: some regimes allow creditors to trigger liquidation of an insolvent company against management to preserve both cash and assets. Likewise, it enables secure senior creditors to boost their recovery in detriment of the *out of the money* creditors (junior) and equity holders.
- *Directors' role*: some strict jurisdictions do not allow management to pursue a workout as soon as the company is insolvent which might trigger an immediate liquidation. Some others allow the management to continue as a going concern through a pre restructuring to minimize costs and maximize the value of the company.
- *Automatic Stay*: this clause aims at deterring senior creditors from seizing the assets and prevents junior creditors from initiating legal actions against the company allowing it preserve

[8] During the year of the "bull market" many LBO companies were granted covenant lite loans with very few or no covenants at all.

valuable assets. It is either automatic, imposed by a judge or grants a moratorium on the debt service allowing the company to retain its assets during the restructuring procedures.

- *Management status* during the insolvency/restructuring: in some jurisdictions management is automatically removed. Some others either allow management to remain if the costs and disruption of a replacement or the supervision by an external advisor are significant.
- *Creditors' role* during the process: if we assume creditors have a say on the restructuring plan, it boils down to their position in the capital structure and to what extent they are *in/out of the money.* It is also reliant on the bargaining power between senior and junior, its voting power and whether the agreement is binding on a dissenting minority of creditors. It is also important whether the dissenting *out of the money* creditors wishes can be overridden (crawdown).
- *New financing* during the restructuring process: some regimes allow additional financing during the process to provide cash to allow the company to operate. Nonetheless, the overriding question is to what extent this financing is senior to the current capital structure and undermines the recovery of the current creditors.
- *Set off*: this framework creates a security to the company if a creditor owes money and can set it off against the debt that company stills owes to the creditor.
- *The length of the process:* the jurisdiction has to strike a balance between a short process (resulting in lower fees and better preservation of the valuable assets) or a longer one (making it more predictable and fair for creditors).
- *Clawback*: this clause allows some transactions around the insolvency filing to be voided so as to avoid granting preferential treatment to some creditors and prevent assets from being uneconomically undermined.
- *Fees*: in both restructuring and insolvency, fees are usually substantial given the array of judges, experts and lawyers engaged in the process. The longer the process the higher the fees that might effectively reduce the recovery of the creditors as these fees usually rank senior to them. Best way to compare fees is to compare the average time of the restructuring in each jurisdiction (Nomura 2010).

4.1 United States (US)

The US bankruptcy code is the most comprehensive and influential code of all existing regimes dating back to the 1789 US constitution. It sits under the federal law and therefore it is applied uniformly across the entire country. The current regime is ruled under the 1978 Bankruptcy code having undergone several amendments, most recently in 2005. Bankruptcies are usually dealt with by the specialized courts that belong to the US district courts that govern both core and non core bankruptcy matters. The latter can be actually scaled up to the District Court and ultimately to the Supreme Court if necessary.

There are two major bankruptcy regimes in the US code:

- *Chapter 7*: This is the proceeding for the company liquidation under the supervision of court appointed trustee.
- *Chapter 11*: this is the procedure to attempt to restructure the company ("debtor in possession") in which the directors stay in control.

Requisites to filing for either of these two regimes, the company must have a domicile, property or a place of business in the US.

Insolvency is defined as the sum of the debt being greater than the asset value. However, the company could well be solvent before initiating the procedure and can file in order to take advantage of the special

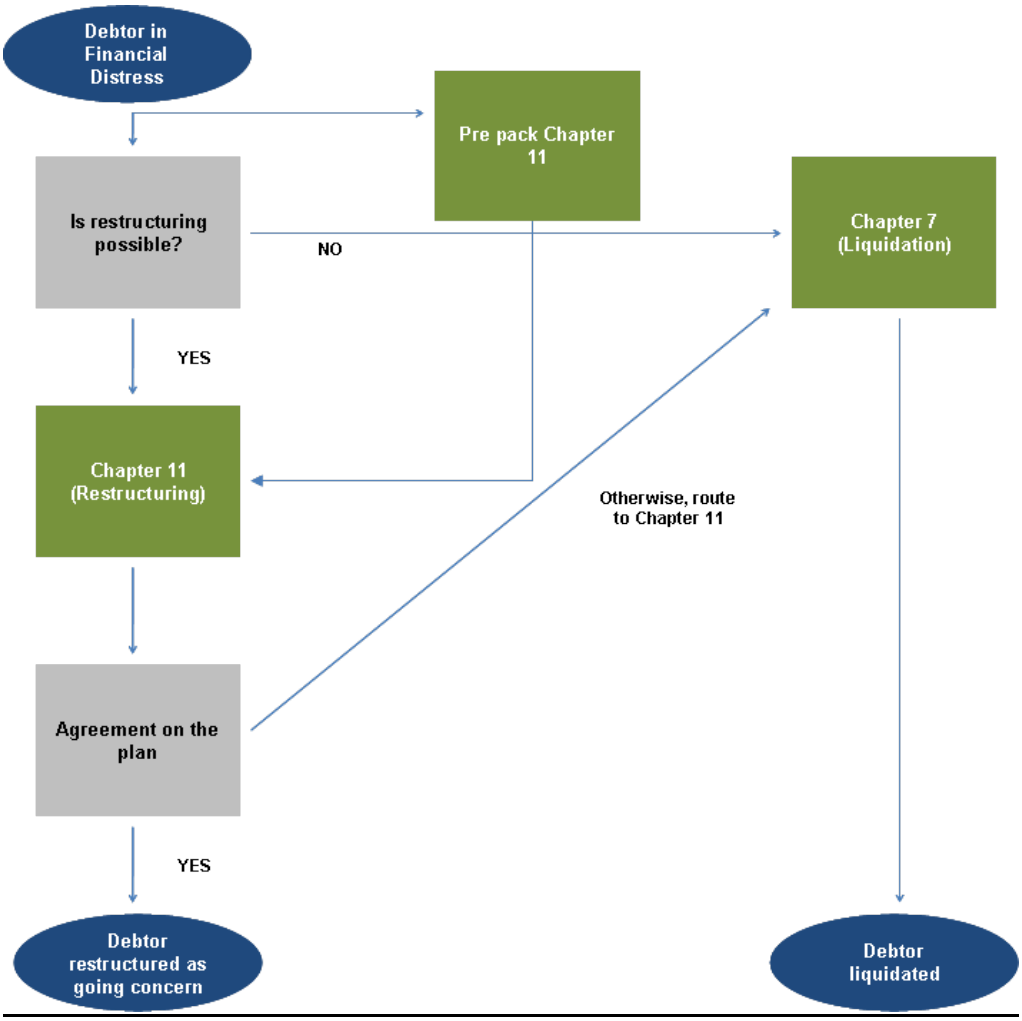
rights granted by the code to address a looming financial problem. Moreover, companies are not legally obliged to apply for bankruptcy protection if it has been able to secure an agreement with its creditors. The main type of security is the mortgage but in general any asset can be used as collateral to senior creditors. Set-off rights are also contemplated as long as it is also permitted under state law (Brands 1992).

4.1.1 Pre insolvency/Workouts

Financially stretched companies are allowed to reach an agreement with their creditors out of the bankruptcy code. This comprises changes in the loan agreement, grace periods, covenant waivers etc. Such modifications must be approved by the majority of the creditors. If this does not happen and the financial situation of the company is rapidly deteriorating, then the filing becomes the next immediate step. Furthermore, companies can also file even if they have reached an agreement to benefit from the special rights provided by the bankruptcy code including the automatic stay. The most common one is the "pre-packaged plan" whereby the company seeks to reach a reorganization plan in advance of a filing. Once the agreement is attained, then the company applies for Chapter 11 and presents the judge the support of the different creditors allowing the company to shorten the time spent in the bankruptcy process as well the negative impact that the filing might have on the company (in terms of reputation, fees and so on).

Below the layout of the US bankruptcy regime.

Figure 6: US Bankruptcy Regime



Source: Nomura (2010); author analysis

4.1.2 Chapter 7

Both the creditors and company can file for the liquidation proceeding. In the former, the company can contest the procedure and operate normally forcing creditor to prove the company is not complying with his debt service duties. Should the petition go ahead, a trustee is appointed and in charge of disposing the asset to distribute the proceeds amongst the different security holders. In the proceeding, the company ceases its operations, starts running down the business and laying off the workforce. There is an automatic stay as well under Chapter 7 whereby all properties repossessions and foreclosures by any of the creditor or set off rights are halted. For multinational companies, the stay also applies to all worldwide assets.

The major difference between liquidation in Chapter 11 and Chapter 7 is that in the former, the management remains in the company and undertakes the liquidation as opposed to the latter being

performed by the trustee. The result under both proceeding might be the same but Chapter 11 allows the management to buy more time to better sell the assets of the company as a "going concern" and enhances the recovery of the creditors. The proceeds are usually higher than those of Chapter 7 and therefore becoming the preferred route for liquidation (Franks 1992).

Section 363 of the Bankruptcy Code governs (rules) the liquidation of the company and advocates that any sale must be approved by the trustee. One interesting feature of the code is the "melting ice cube" test that allows assets to be sold off faster than expected if the value is eroding as a result of the liquidation.

4.1.3 Chapter 11

The US restructuring is usually articulated through the Chapter 11 of the Bankruptcy Code. This proceeding begins with the creditor or the company filing it with a bankruptcy court. Once the filing is granted, the automatic stay sets in and halts all creditor claims. Likewise, the company has to provide an in depth balance sheet and profit and loss account (P&L) as well as a schedule of contracts, leases etc. A company under the governance of Chapter 11 is called DIP ("Debtor In Possession"). The management remains in place and run the company normally subject to supervision of the secured lenders and a trusted appointed by the unsecured creditors. In general, management has "leeway" to carry out his duties albeit for some required transactions (sale of key debtor's assets, new borrowing, etc) court approval is mandatory.

Management could lose its DIP status if they are proven guilty or dishonest. If so, a trustee is set up by the creditors and manages the business over the course of the procedure. It may also happen that creditors file their own plan or take the Chapter 11 into Chapter 7 to wind the company up.

The automatic stay prevails over the course of the proceeding and applies to both secured and unsecured creditors. Reasons for circumventing the stay could be that some of the company's assets lack the necessary equity or they are not essential in the operating business.

The unsecured creditors' trustee, usually formed by the seven largest creditors, plays a pivotal role in the restructuring process as they look after the rights of the unsecured creditors as well as ensuring that the reorganization goes as planned. The trustee can hire accountants, advisers or lawyers and have their expenses accounted for by the company along with interacting or interviewing the management and use all internal information.

The company can raise new financing through the "Super Priority/Senior" status ("DIP" Loans) ranking above all liabilities including taxes, wages, administration fees and senior secured debts) allowing DIP lenders to support the company. "DIP" financing can only be approved by the court provided that the other secured creditors have been adequately protected - interest payment, new granted securities (but still junior to the DIP lenders) etc.

Management or the trustee replacing the former has 120 days (or a maximum of 18 months) to propose a restructuring plan to the court. The purpose of this plan is to present it to the creditors who will vote on or against it. If the deadline is consumed and no plan is presented, then any of the creditors can propose a new reorganization plan. This plan lays out the relationship and treatment of the different securities. Not all the creditors will vote on the plan. Creditors receiving par on their loans will refrain from voting whereas the fully impaired ones will probably reject the plan. The rest of the unimpaired creditors must vote on the plan. These creditors are divided into classes and each one votes within it. In each class two-thirds or more of creditors by size of claim and more than 50% of creditors by number must vote for the plan for it

to be approved by that class. If this happens, all creditors are bound by the plan even those against it. The court will then confirm the plan once it has been accepted at least by one class of non-insider (Insiders are relatives, general partners, and directors or officers of the debtor.) holding impaired claims.

The Bankruptcy code also includes the so called “cramdown mechanism” whereby a vote of the dissenting creditors of a plan can be overridden under certain conditions. These conditions include a requirement that another class of impaired creditors must have voted in favor of the plan, that there must be no unfair discrimination, that the plan must be fair and equitable and that the plan must obey the absolute priority rule (Bercker 1995). This states that a junior creditor cannot receive any payment until all more senior creditors have been repaid in full” (Nomura 2010).

Once the court confirms that the reorganization plan complies with the code, the plan is confirmed and the company emerges from Chapter 11. It must be noted that assets can be disposed during the proceeding provided that the company files for a motion with the court, notifies all creditors and has the sale approved by the court. Section 363 rules the sale procedure and it warrants a sale provided that it is done in the best interest of the creditors

4.1.4 Priority of payments

The US Bankruptcy code is articulated under the “absolute priority rule” (APR) stating that a creditor cannot be partially or fully paid unless all senior creditors has been fully paid. The priority list is as follows:

1. Super Senior/priority claims under DIP loans.
2. Administrative expenses: legal fees, certain taxes, etc.
3. Wage claims, employee benefit plans and certain taxes.
4. Secured claims.
5. General unsecured claims.

4.2 The England and Wales (UK)

The England and Wales bankruptcy code is probably the most used and known within Europe. It is used by England and Wales based companies as well as foreign companies that can prove any connection to this jurisdiction. The code comprises several laws mainly the Insolvency Act 1986, 2000 and the Enterprise Act 2002.

The main proceedings are:

a) Members’ voluntary liquidation.
b) Creditors’ voluntary liquidation.
c) Compulsory liquidation / Winding-up.
d) Administration.
e) Company voluntary arrangements.
f) Schemes of arrangements.

In UK, bankruptcy procedures are usually handled by the country court where the company has its head office as there are no dedicated bankruptcy courts. Insolvency is defined as the situation where the company is unable to service its debt. A twofold test is undertaken: a balance sheet test to assess whether assets are higher than liabilities and a cash flow test to ascertain whether the company can service its own debt. If either or both are negative then the company is deemed to be insolvent. This is a compulsory requirement for a company to file for insolvency. However, there is no obligation to file for

insolvency even if the company is insolvent. The 2006 Company Act states that the board of directors has the duty to preserve the right of the stakeholders and therefore the welfare of the company. If management is found to behave dishonestly, there is an offence ("wrongful trading") that carries a penal fine (Gilson 1989).

Securities can be either immovable or movable. The former is usually property (real estate) than can be secured using fixed charge or a mortgage. A mortgage usually shifts the legal ownership of the asset from the debt to the creditor until the debt is paid down. A fixed charge means that the company can sell off the asset once the creditor has been reimbursed but no transfer is done.

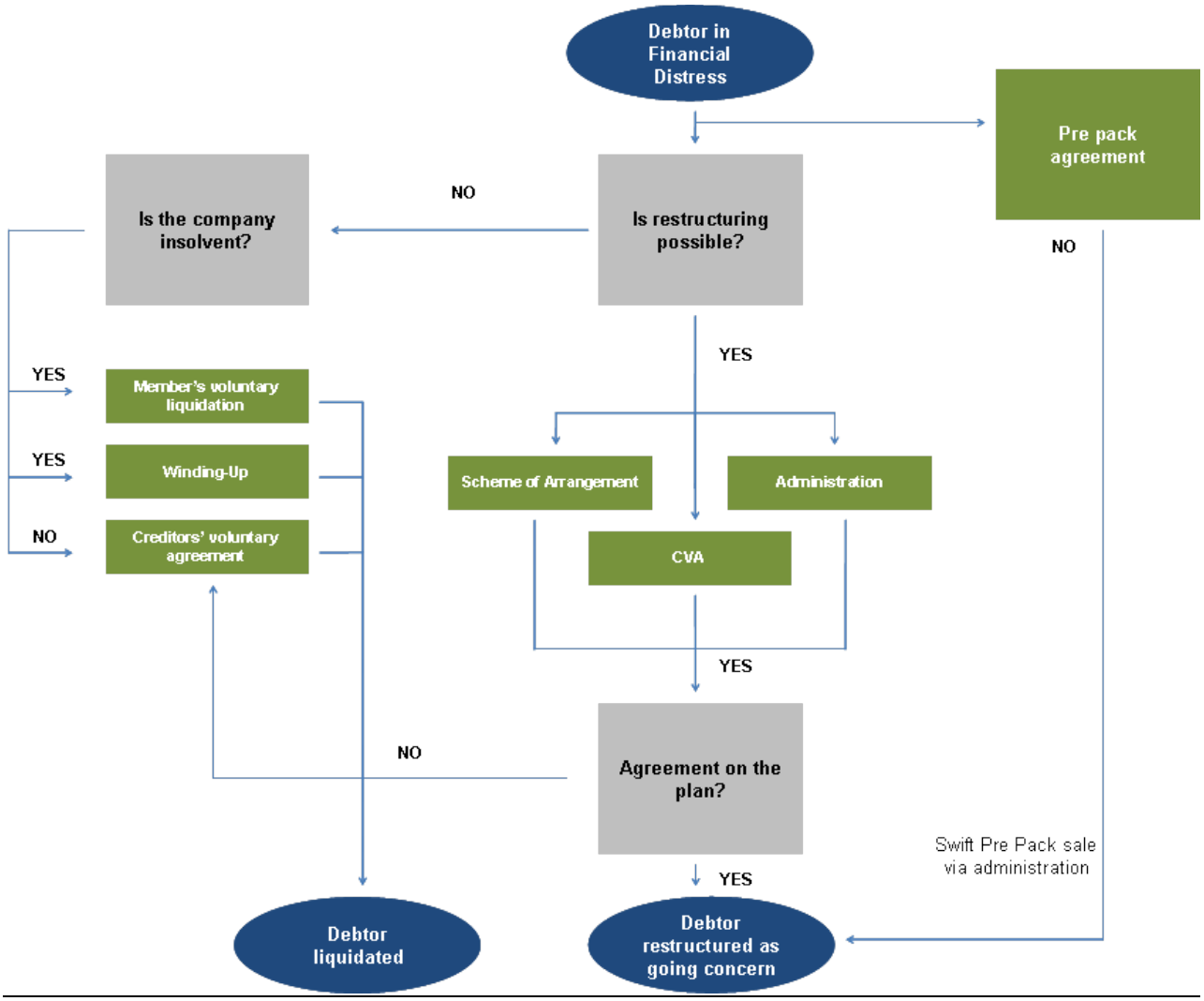
As far as movable securities are concerned, they could be mortgages or fixed charges. Additionally, there are floating charges, liens and pledges. A floating charge is linked to a class of assets and not to a specific asset. If the company defaults, then the floating become fixed to a specific asset and behaves like a fixed charge. The lien grants a creditor the right to retain the asset until his debt is repaid. The pledge however gives the creditor the right to possess the asset until the debt is reimbursed.

4.2.1 Pre insolvency

As the company is allowed to carry on operating while insolvent, it is not easy to distinguish between pre and post-bankruptcy. One of the most popular pre insolvency routes for insolvent or close to insolvent companies are the "pre pack" whereby the company or some of its assets are sold after an agreement has been reached before the announcement of formal insolvency and having been approved by the administrator prior to his formal appointment. Once the company initiates the administration proceeding, the administrator executes the sale agreement (Nomura 2010 & Gilson 2000).

Below the layout of the England and Wales bankruptcy scheme.

Figure 7: UK Bankruptcy Regime



Source: Nomura (2010) and author

4.2.2 Liquidation

The bankruptcy code contemplates three ways for a company to begin liquidation:

Member's voluntary liquidation

This proceeding cannot be used unless the directors can officially prove that the company is solvent and 75% of shareholders approve on it. Management is removed and a liquidator takes over. If the directors cannot declare the insolvency, then the proceeding moves to a creditor's voluntary liquidation.

Creditors' voluntary liquidation

To be eligible for this procedure, the company must be insolvent and counts on 75% of the shareholders' support. A liquidator can be appointed by the shareholders but with very limited powers. Directors must hold a meeting within 14 days and present an in depth document of the current state of the company. The

liquidator can be replaced through a vote by the majority of the creditors and then apply to the court for a stay on proceedings.

Compulsory liquidation / Winding up order

Creditors can take the company into liquidation (winding up order) if they apply to the court for a compulsory liquidation. The trigger would be that the company is unable to service its debt or has failed either the balance sheet or cash flow test. If the petition is approved, then management is removed and the company can be run off.

In all these procedures, a liquidator is appointed to sell all the company's assets. This may be done by public auction or private contract without court sanction. Then, all the proceedings are shared between creditors and equity according to the priority of payments (Nomura 2010).

4.2.3 Reorganization

If the purpose is to restructure the company, there are three options:

4.2.3.1 Administration

Introduced by the Insolvency Act 1986 and revised by the Enterprise Act 2002, its purpose is to rescue the company as a going concern. This procedure can be initiated either by court order or out of court. In the latter a security holder with a qualifying floating charge can appoint an administrator. Additionally, the company management can appoint an administrator prior notice to the security holder. In the former case, the creditors or the company can apply for an administration order to the court and prove the company is insolvency or close to insolvency. The administration has different statutory priorities in a fixed hierarchy: first is to rehabilitate the company as a going concern; second, if the former is not applicable, the administration will aim to attain a better outcome for creditors rather than a simple winding up. If this is not viable, then the administration will pursue to dispose the company's assets to realize the value for the secured and senior creditors without undermining the interests of the entire universe of creditors (Nomura 2010).

Once the administration sets in, there is an automatic stay on proceedings and any creditor enforcement action. However, there are some exceptions as the owners of financial securities (shares, debt or cash) are allowed to terminate their contracts, enforce securities and fulfill rights of set off. These security holders can ask the court to temporally lift the stay provided that this would not hamper the administration procedure. The administrator takes over the management and looks after the interest of the creditors as a whole. This has to be published in the major newspapers.

The administrator has to send a proposal of the administration procedures after eight weeks and present it to the creditors. The proposal has to reach simple majority by value of creditors present and voting including unsecured creditors and also those secured that have been impaired. If the proposal is declined, then the administration will turn to the court for guidance. After 12 months, the administration expires (it can extended by six months more subject to creditors request and court approval). During the administration the company can take on new loans senior to both floating charges and unsecured creditors but junior to secured and fixed charges.

Administration is mostly used a mechanism to enable a "pre pack sale". The administrator is provided with a company's sale plan before it is actually appointed by the company. The plan should contain a company's valuation showing the creditors are obtaining the best possible outcome and then a buyer is to

be found. The approval to sell assets has to come from the secured creditors, albeit the administrator does have some additional powers to deal with secured assets free from the security. Once the sale is agreed, then the administrator is appointed and the sale is closed out immediately. If the whole business of the company is sold off then the company does not survive (but the business does) and it is wound up.

4.2.3.2 Company Voluntary Arrangements

CVA was introduced by the Insolvency Act 1986 and mostly used when the company is likely to come out as a going concern. Its main purpose is to clinch a deal between the company, share/debt holders in which creditors are willing to delay or reduce debt payments. This arrangement does not provide for an insolvency practitioner (administrator) taking powers over the company and there is no requirement for the company to be insolvent. This proceeding is started by the management through a proposal to shareholders and creditors. There is an automatic stay but only applicable to small companies: a turnover less than £5.6mn, assets worth not more than £3.26mn and no more than 50 employees. Initially the stay is for 28 days but with creditor consent it can be extended to up to three months. There is no stay for large companies.

CVA requires majority approval above 75% of unsecured creditors and they are not divided into classes to both encourage discussion and to protect the rights of all creditors. It also allows *out of the money* creditors to block the restructuring if they have no economic interest. If the agreement is reached, then it becomes binding to all creditors but cannot affect the secured/preferential creditor rights without their consent and has also come with the approval of the shareholders. Nonetheless, if the creditors and shareholders disagree, the creditors' agreement prevails subject to the court order. Once it is implemented, the insolvency practitioner is appointed to supervise. The role of the court is effectively down to resolve any disagreement or dispute. CVA is applicable to any EEA company provided that it has a COMI in the UE.

4.2.3.3 Scheme of Arrangement

This arrangement is supervised by a court within the 2006 Companies Act. There is no insolvency requirement. The scheme can be initiated by any creditor or the company and there should be a formal application to set up a creditors' meeting. Management keeps his powers and no insolvency practitioner is appointed. Majority of approval above 75% or more by value and in number of each class is necessary and must also count on the shareholder's approval. The company has to decide over the different creditors classes to approve the scheme. There is no stay during the scheme; hence secured creditors are allowed to exercise their securities and unsecured creditors to take claims against the company. This is by far the most detrimental feature of the scheme. By all means, these rights can be removed as long as the scheme is approved and received a court sanction. Once approved the management implement and supervises it.

4.2.4 Priority of payments

The distribution is contained under the Insolvency Act. In general, CVA or the scheme should never give a creditor a lower recovery than otherwise achieved through liquidation. In a declining order, the priority list is as follows

1. Fixed charge holders (as secured assets are excluded from the estate).

2. General expenses and the costs of the liquidation, including the liquidator's remuneration.

3. Preferential creditors which generally relate to employee rights such as accrued pay and pension rights.

4. A fund for unsecured creditors (up to a maximum of £600,000) from the realization of assets subject to a floating charge.

5. Floating charge holders.

6. Unsecured creditors.

4.3 Germany

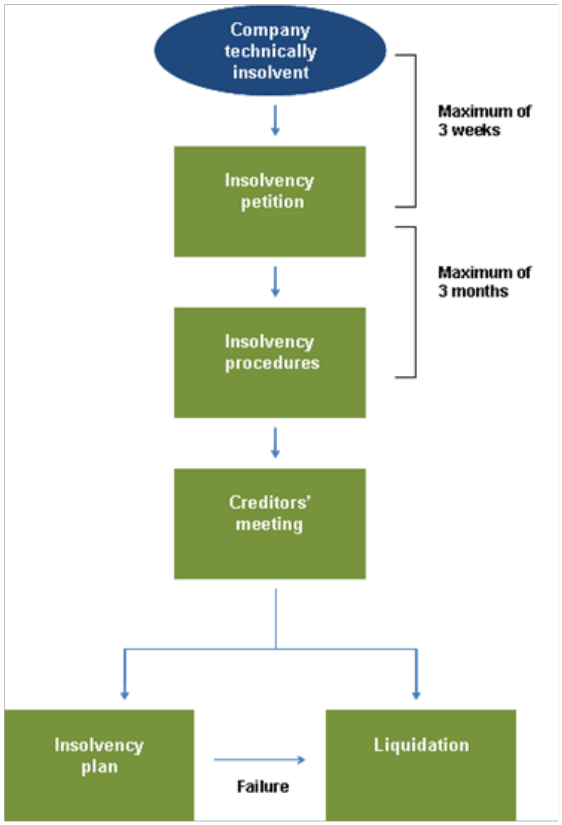
The German insolvency framework (*Insolvenzordnung*) is based on the 1989 German Insolvency Act. There are two main regimes leading to either liquidation or to an insolvency plan. There both court supervised by the district the company has its head offices. The main forms of securities are land charge (*grundschuld*) and the mortgage (*hypothec*). For moveable securities, the main ones are the transfers of receivables/assets, chattel pledge or the retention of title. Set off is permitted provided that the position came up before the beginning of the insolvency process (Nomura 2010).

Insolvency is assessed using two tests:

- *Illiquidity*: evaluating whether the company can service its obligations
- *Over-indebtedness*: occurring when the company's obligations are not covered by their assets

Below, a summary of the German restructuring code.

Figure 8: German Bankruptcy Regime



Source: Nomura (2010); author analysis

4.3.1 Pre Insolvency

Informal workouts are common between creditors and debtors as long as consensus is reached.

4.3.2 Insolvency

Management is contractually bound to file for insolvency in no more than three weeks from the moment they are aware that the company is either short of liquidity or over indebted. Failure to do so is a criminal offence under the civil law. The insolvency procedure, in any of the two forms, is initiated by applying to the preliminary process by either the company or the creditors. In the latter case, the company is entitled to be briefed before any petition is conceded. In the former, the company can file and an administrator is appointed to draw up a report assessing the financial health of the company.

Amongst several roles of the administrator, the most common one is to monitor the management that remains in the company. Also, the court can impose the company to obtain the administrator consent before an asset sale is undertaken but there is no prohibition on asset sales (the so called “weak administrator” status) or otherwise grant the administrator full responsibility on asset sales (“strong administrator”).

During the preliminary procedures, a stay on moveable assets is usually imposed. Real estate assets may be also stayed by the administrator’s decision. The court must determine, in a maximum period of

three months, whether the company's assets are enough to cover all the costs of the procedure. If so, then the proceedings are opened and the court appoints an administrator. Creditors and debtor can put forward their suggestions but ultimately it's the court's call. Then, there is an automatic stay on ordinary creditors. Secured creditors are allowed to enforce their rights over immoveable assets and also over moveable assets as long as they are in their possessions (Pantaleo 2005).

The main goal of the administrator is to keep the company as a going concern until the creditors get together sometime within the first three months since the initiation of the proceeding. New money can be raised to keep the business operating and is granted preferential status. The creditor's meeting is made up of secured/unsecured creditors (representing a majority of claims) plus the company and the administrator. The administrator must count on the approval of the creditor's committee for any relevant transaction and compile the list of creditor's claims to decide whether to liquidate or rehabilitate the company.

4.3.3 Liquidation

If the creditor's meeting calls for the company insolvency, a verification meeting is set up to confirm the amount and claim's rank. Then, assets are sold and employees laid off.

4.3.4 Restructuring

The insolvency is law is meant to restructure and preserve the value of the company. It is also intended to sell the company using for instance a pre-pack plan or to facilitate liquidation. The plan can only be put forward by either the administrator assisted by the creditors or by the company itself and among other features, it should lay out the treatment of every single creditor (secured creditors, employees, etc).

The administrator is allowed to borrow new financing that will rank senior to existing lines including fees and administration costs but below claims that arose in pre insolvency order contracts. Therefore, this new financing cannot be regarded as super senior since the new lenders sit behind other creditors as it is described in 4.3.5. For a plan to be approved several conditions must be met:

- A majority in value and number of the voting creditors of each class must support it. The insolvency plan allows for a crawdown mechanism. Should a plan is accepted by the majority but not all classes, the court can still accept the plan as long as the nonvoting creditors are better off with the plan than without it and the recovery is equitable and fair versus the recovery of other creditors. Additionally, there must an equal treatment of creditors in each class. Moreover, the non-voting creditors are supposed to receive a reasonable share of the economic value under the plan.
- The plan has to be adopted by the debtor. His opposition can be invalidated if he is equally treated by and without the plan.
- The court must also approve the plan and implement via the supervision of an administrator. Once the plan is approved, the administrator stands down and the management takes over the debtor again.

If the plan is rejected by the creditors or dismissed by the court, the courts will decide to pursue liquidation or a sale. It must be noted that the insolvency code includes a provision for self-administration enabling the management to maintain control on the company under the supervision of an expert appointed by the court in line with Chapter 11. However it is usually common to replace the current management for an experienced body of directors in corporate restructurings.

4.3.5 Priority of payments

The order of distribution in insolvency proceedings, unless an insolvency plan states otherwise, is as follows:

1. Secured creditors.

2. The following rank equally and so are paid pro-rata:

    a. Cost of insolvency proceedings including court fees and administration costs.

    b. Post-order and post-filing claims resulting from the actions of a preliminary administrator with complete control over the company's assets. This includes so-called "DIP-style" loans made to the company after the filing.

    c. Claims resulting from pre-order contracts if the administrator chose performance of the contract.

3. General unsecured creditors.

4. Subordinated unsecured creditors.

5. Equity (according to shareholders' rights).

4.4. France

The French bankruptcy regime, once labeled as a creditor unfriendly framework, has come a long way to ensure the rehabilitation of companies facing financial distress through several new laws (the last in 2005 – The Safeguard Insolvency law). These new Chapter 11 type of laws and reforms are meant to encourage voluntary arrangements between creditors and debtors by promoting insolvency procedures before the insolvency tests fail. The main proceedings are:

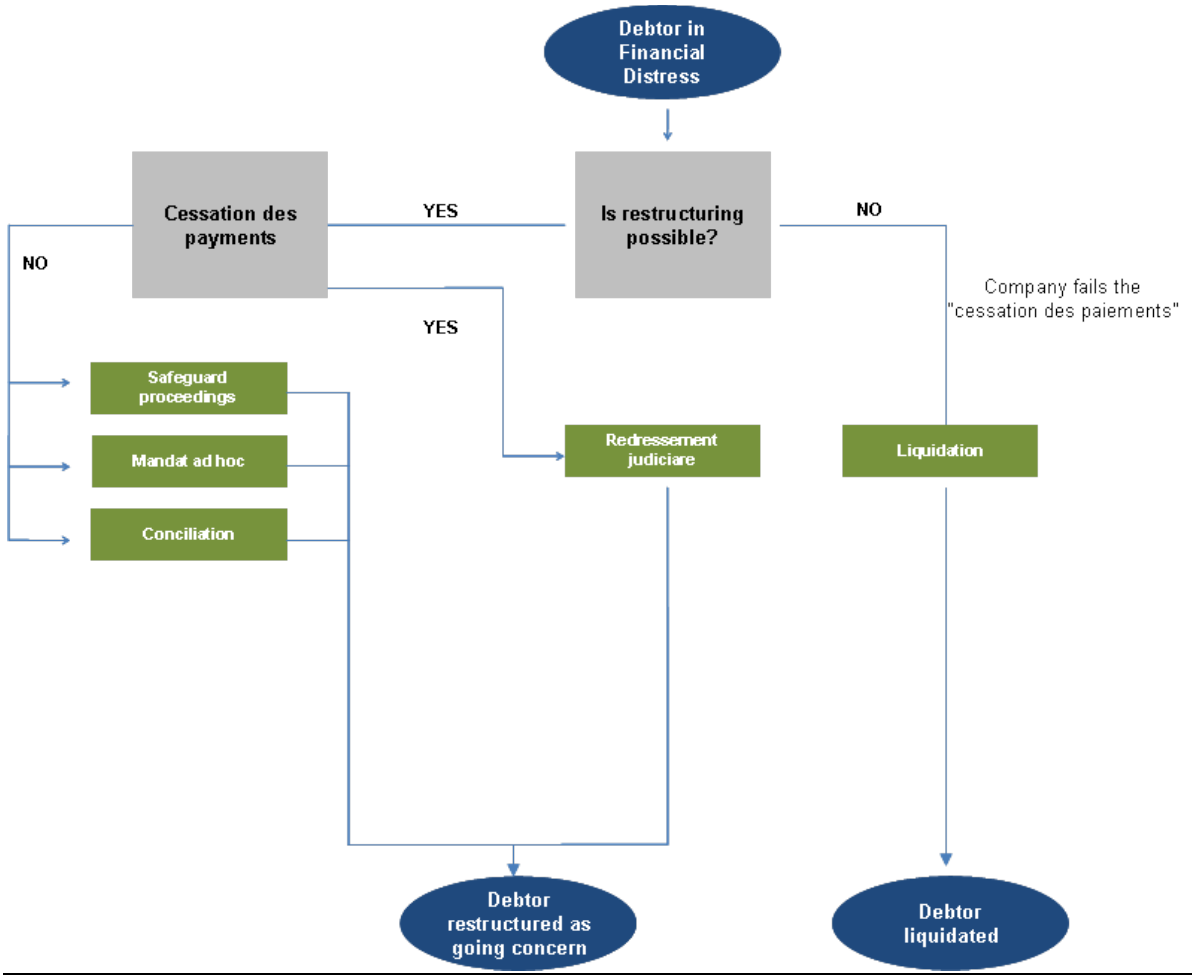
- Liquidation proceeding
- Mandat ad hoc proceeding
- Conciliation proceedings
- Safeguard proceedings
- Redressement judiciaire

In general and in most of these proceedings, the responsibility lies on the commercial court where the company has its office registered. Immoveable assets usually command a mortgage or a lien. For moveable assets, pledge or title retention is the typical security. Floating charge is not contemplated. Set off are common for reciprocal debts happening either after or before the initiation of the proceeding.

In France, the insolvency is defined as a company not being able to pay its debts as the come due ("cessation des paiements"). The balance sheet test does not apply.

Below, the layout of the French bankruptcy scheme.

Figure 9: French Bankruptcy Regime



Source: Nomura (2010); author analysis

4.4.1 Pre insolvency

Creditors and debtors face no hurdles to informally agree a restructuring whilst the company remains solvent. They can use any of the available restructuring proceedings: for solvent companies, insolvent companies for less than 45 days and for truly insolvent companies.

4.4.2 Liquidation

Any company within 45 days of becoming insolvent can apply for conciliation, *redressment judiciaire* or liquidation proceedings. If the company is not operating anymore or recovery is very low, the *liquidation judiciaire* will set in.

A creditor can start the process involuntarily after proving the court it has not received the payment. Additionally, the creditor must also prove the company has ceased its trading or the recovery is not possible (Nomura 2010).

The court appoints a liquidator who replaces the management. If the company cannot operate as a going concern, then it will split the company into parts to be disposed. If the company can trade as a going concern, a three month (extendable to six) period is opened to sell the company. Creditors have to file a statement of claims within two months (if based in France or four months otherwise) after the liquidation order is published in the Official Gazette (Nomura 2010).

There is a stay for both secured and unsecured creditors but the former can lift it in two scenarios. In the first, the court does not allow the company to trade as a going concern and the liquidators fail to dispose the secured assets within three months since the liquidation begins. The second case involves the authorization of the company as a going concern but after the three or six month period, the collateral was not incorporated in the company's sale. If the company is liquidated, the distribution of proceeds follows the priority laid out in 5.4 and usually lasts between three to four years.

4.4.3 Reorganization

There are four different rehabilitation proceedings:

4.4.3.1 Mandat Ad Hoc proceedings

This mechanism can only be initiated by the company. It a simple, informal and confidential procedure that can only be used if the company remains solvent (the debtor has not breached the *cessations des paiements* test).

In this procedure, the management stays in the company and a professional (*mandataire ad hoc*) is appointed to help the management to formulate a rehabilitation program with creditors. Nevertheless, his decisions are not binding and the court could impose a rescheduling/moratorium of debt maturities/payments and force a stay on the collateral. This procedure has no deadline hence it lasts as long as the court decides.

There is no drawdown mechanism therefore a court needs the consent of all creditors to impose a rescheduling of their claims. This usually implies the *out of the money* creditors receiving some sort of recovery (usually in equity) to achieve unanimity. If the rescue plan is not agreed, this could trigger liquidation or the transfer to any of the other three proceedings.

4.4.3.2 Conciliation proceedings

This procedure can only be used if the company is solvent or has been insolvent less than 45 days and has to be initiated by the company. The management has to provide the economic, social and financial situation to the court to decide if the company's situation is fixable. Management stays in the company and a professional is appointed to facilitate the negotiation of a voluntary agreement with the creditors. Likewise, there is no automatic stay on the collaterals. The court might impose a two year rescheduling of the creditor claims. The negotiation period ends after four months and requires the consent of all creditors. There is no cramdown, therefore, creditors are not forced to accept any rescheduling/reduction of their claims.

One of the key features of this proceeding is that post insolvency financing is permitted as long as the exit from the plan is public (however it is junior to employee salaries, court expenses and fees). If the agreement is reached, either it is certified by the president of the court rendering the agreement and the process confidential or it is just approved by the court, made it public and given the legal power of a court

judgment. The latter entails that the company is a going concern, solvent and the agreement does not unfairly undermine the interests of any of the creditors (Franks 1992).

4.4.3.3 Safeguard proceedings

This rehabilitation process is only allowed if the company is still solvent at the filing. To be eligible for this mechanism, the company has to prove that faces strong difficulties that cannot overcome. The proceeding has to be initiated by the debtor only and file it in the appropriate court. The court is to decide whether this is the appropriate mechanism and if it is likely to survive. This proceeding and its decisions are always made public. Management stay in the company and an administration could be appointed to oversee or help the management to reach an agreement with creditors.

The company has up to six months to negotiate a plan that can be extended up to 18 months. There is an automatic stay across the entire capital structure as well as temporary suspensions on debt payments and on acceleration. For big companies, there are usually two creditor's committees, namely one for the main suppliers and other for credit institutions including holders of bank debt purchased in the secondary market. The company presents the restructuring plan to the credit committee assisted by the administrator. Plan approval involves at least 66% majority by claim size in both groups. If there are also bonds outstanding, the plan requires at least two thirds majority by claim size. Then the court can approve the plan which will be binding for all debt holders. If a court approval is not reached, then creditors are consulted individually on the debt repayment proposals. The plan cannot force debt forgiveness and lasts longer than 10 years.

If the company becomes insolvent during this proceeding and can still be rehabilitated, this mechanism can be turned into our last proceeding: the redresseemnt judiciaire.

4.4.3.4 Redressement judiciaire

Similar to the previous one but only applies for insolvent debtors. It can also be initiated by the creditor but has to prove that the company has failed to repay its obligations. To initiate this procedure, the debtor must still be operating and has a good chance to be restructured. The maximum observation period is six months that can be extended to 18 months whereby the courts evaluates to what extent the company should undergo a restructuring or liquidation.

There is an automatic stay on security enforcement. The approval of the rescue plan is similar to that of the safeguard procedure. At the end of the process, if the agreement fails, the court can present a plan where the stay can last up to 10 years. If not, the company is liquidated.

4.4.4 Priority of payments

Since a number of different laws address the priority of payments, it is not possible to state a precise order that will always be valid. However, roughly speaking, the payments to creditors are made in the following order starting with the highest priority:

1. Unpaid amounts due to employees (e.g. wages, amounts due with respect to accrued and untaken holidays) for the 60 days before opening of proceedings.

2. Judicial costs.

3. New post-insolvency financing (see the Conciliation process).

4. Perfected mortgages and pledges with retention rights.

5. Post-judgment claims incurred in the course of the insolvency process (fees, claims).

6. Pledges without retention rights.

7. General privileges, including tax and social security claims.

8. Unsecured debts which arose before the start of proceedings.

4.5. Spain

Spain has been historically a regime that filing companies have been wound up rather than rehabilitated. One key reason would be the major presence of banks in the supply of corporate debt. As bank debt is usually secured, they are more prone to liquidate the company and execute the security rather than attempting to restructure the company.

The Spanish parliament has been quite active in upgrading the current legislation (last time was in April 2009) and passed a new insolvency law (*ley concursa*l) in April 2003 inspired by the several overhauls of the German law and fundamentally by the US Chapter 11. This new law tend to simplify the former insolvency regime with a single entry point (*concurso de acreedores*) leading to either restructuring or liquidation. Moreover, it aims to reduce the time spend by companies in liquidation or restructuring as well as its related costs (Nomura 2010).

There are four main insolvency proceedings:

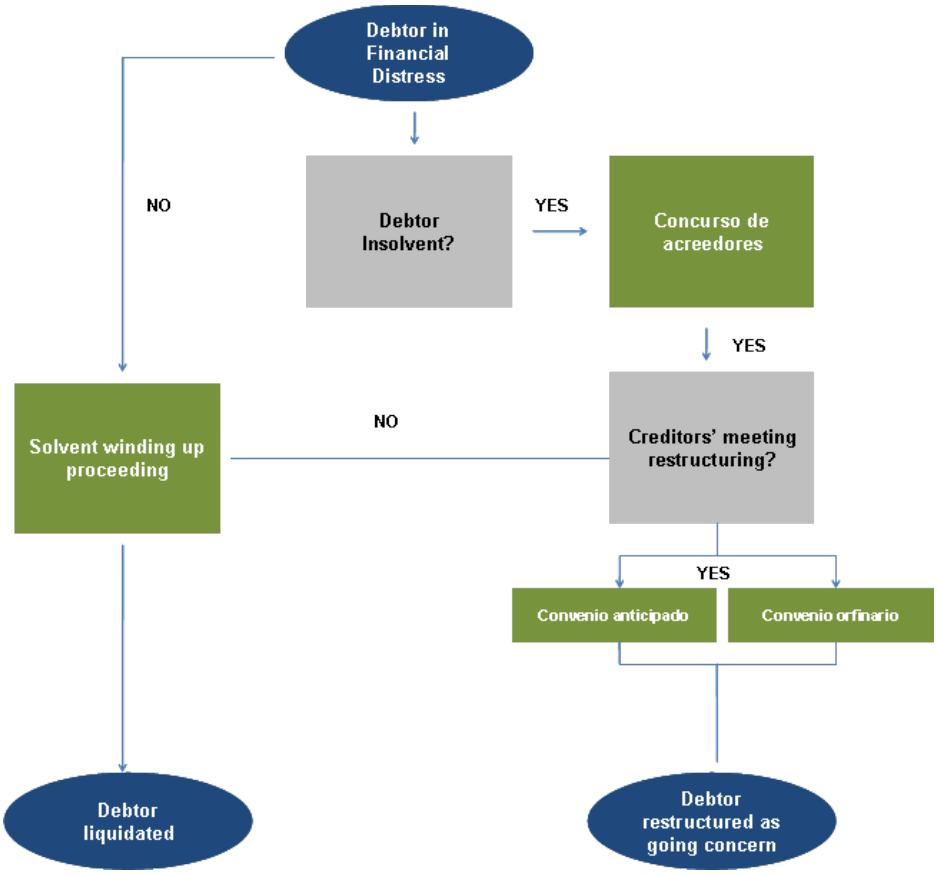
- Solvent winding up.
- Common Entry leading to anticipated creditor's agreement.
- Common Entry leading to ordinary creditor's agreement.
- Common entry leading to liquidation.

Insolvency cases are supervised by special courts created by the 2003 law based in the region where the company has its main commercial interests. Insolvency is defined as the inability to regularly meet financial obligations. It is a cash flow test ie no balance sheet test. If the company is financially stretched and the management continues with the ordinary business that undermines the positions of its creditors, they could be held accountable for penalties, including prison.

The main type of security for immoveable assets is the mortgage whereas for moveable assets is the pledge. The former must be granted in a public document and registered in the *Registro de Bienes Muebles*. The latter is held by the creditors until debt is reimbursed and has to be granted via public deed. Set off can be allowed under certain circumstances (Newton 2003).

Below, the layout of the Spanish bankruptcy mechanism.

Figure 10: Spanish Bankruptcy Regime



Source: Nomura (2010); author analysis

4.5.1 Pre insolvency

Companies and creditors can informally agree an informal restructuring but the agreement has to be reached among all creditors to become binding. The main pre insolvency proceedings are:

- Solvent winding up: any solvent company can voluntarily apply for a winding up. Shareholders must hand down a resolution to liquidate the company. Management is usually removed and liquidators take over to sell the assets. If the financial situation of the debtor has worsened to a level where the net asset value of the company might drop below half of the value of the capital (impairment test), the board is compelled to call up a general shareholder's meeting. This meeting will allow seeking an increase or decrease of capital unless the company is bound to file for insolvency. Distress companies can raise pre insolvency refinancing provided that the agreement is approved by at least 60% or creditors by value, by an independent expert and must be articulated in a public document. If the debtor's insolvency is imminent, then it can apply for a post insolvency proceeding.

4.5.2 Insolvency

4.5.2.1 Liquidation

The Spanish liquidation process is not liquidation per se as it focuses its emphasis on selling the business as a going concern by preserving the economic value of the company. The liquidation plan is drawn up by the liquidator and it does not need to the approval by the creditor or debtor.

There is limited stay where pledges and mortgages holders can enforce their securities as long as the asset is not essential to the business or a year has gone by without the liquidation process begun.

4.5.2.2 Out of court restructuring

Most of the court restructurings have historically ended up in liquidation mostly due to the presence of bank creditors within the capital structure. Nevertheless, one can witness how lately the banks are switching their strategy to out of the court debt renegotiation involving in many cases banks seizing up their guarantee and becoming shareholders of the company. In other situation, banks are more proactive to agree on a restructuring plan to steer clear of a bankruptcy proceeding.

4.5.2.3 The Concurso de Acreedores

The most recent Spanish insolvency procedure is the *concurso de acreedores* (creditors' meeting) which can lead into either restructuring or liquidation. The company is bound to apply for the insolvency process within two months of becoming insolvency otherwise management can be held liable for the losses. This can be extended to an additional three months provided that has been communicated to the court and is meant to facilitate the creditor's negotiations. After that, the debtor has to file for insolvency in the next month. The company must provide the annual accounts of the last three years, a financial report specifying the company assets, and a full list of creditors. The judge has full power to decide whether the insolvency procedure is applicable by evaluating the financial situation of the company (whether it is insolvent or it is likely to be insolvent in the near future).

If the debtor contests the application of the involuntary insolvency procedure, a hearing will take place. Creditors will have to provide any of the following proofs: company's assets have been foreclosed; company has ceased payments; company is winding itself up gradually and could compromise certain obligations to be paid such as wages (Nomura 2010).

In an involuntary insolvency, the first creditor to apply for the proceedings sees 25% of its claims promoted within the privileged status in the priority of payments. In addition to that, any creditor that has bought the debt after it was due cannot apply for the insolvency within the next six months.

If the insolvency proceeding is approved by the judge[9], the management remains on board and three administrators are appointed comprising a lawyer, unsecured creditors representative, and either an economist or an accountant. Their task is to assess the company's assets and debt and agree on the process.

An automatic stay is imposed on unsecured creditors as well as on the debt interests. The judge can also extend the stay to senior creditors to preserve the business operating as a going concern.

[9] Then it has to be published in the Public registers and in the website: www.publicidad. Concursal. es

The insolvency law contemplates claw backs including harmful transactions to the debtor's assets over the last two years before the insolvency announcement.

The insolvency procedure breaks down into several stages: The common period that finishes with a detailed report of the debtor's assets and the list of creditors. After that, the creditor's meeting is set up with more than half of the creditor present to lay out the next step leading to restructuring or liquidation.

4.5.3 Court restructuring

There are three main proceedings within the Insolvency Act 2003 aiming to restructure the company as a going concern:

4.5.3.1 Anticipated Creditor's agreement

The *convenio anticipado* (composition agreement) is a pre-packaged type of agreement first agreed by at least 20% of secured and unsecured creditors by value during the common period. If the anticipated proposal is put forward at the beginning of the process then 10% of creditors are enough to apply for this procedure. The aim is the continuation of the business including debt equity swap, debt cancellation etc. Then the plan is presented to the rest of the creditors and has to be agreed by at least 50% of the unsecured creditors. Minority creditors can be crammed down. There is no a Chapter 11 type DIP financing but it provides higher priority for all the post insolvency payments on services and goods

4.5.3.2 Ordinary Creditors' agreement

The convenio ordinario (ordinary creditors' agreement) is a back up restructuring if the previous proceeding fails. This is plan is presented by the company or more than 20% of creditors by value at the end of the common period. This framework is more restraining compared to the previous one. For instance, there is no change in priority of creditors, write downs above 50% of the creditors' claims, or debt cancellation longer than 5 years. This plan has to be approved by both senior creditors on both secured and unsecured basis. Junior creditors have no vote on this plan. Creditors that have purchased debt after the announcement of the insolvency do not vote on the approval of the plan[10].

4.5.4 Priority of payments

The insolvency act distinguishes between claims against the *créditos contra la masa* (estate) and claims against the *créditos concursales* (insolvency). Claims over the estate includes administrator fees, legal costs, debt incurred during the insolvency and salary for the 30 days before the announcement of the insolvency limited to a twice of the minimum salary. These claims have absolute priority over the rest of the claims.

The ranking is as follows:

1. Privileged claims:

[10] A strong reason why the Spanish distressed debt market has not reached scale.

a. Specially privileged: covering secured creditors on real estate, mortgage, pledge and securities.

b. Secured creditors are paid off the proceeds of the securities. If they are still impaired, they have a claim at the ordinary level.

c. Generally privileged: salaries up to a limit, certain taxes and 25% of the claims of the first creditor filing for insolvency.

2. Ordinary claims: claims not deemed privileged or subordinated.

3. Subordinated claims: contractually subordinated debt, interest and related party debt:

   a. Shareholder's claims owning over 5% of the capital of listed companies and 10% of non-listed companies.

   b. Claims of directors, liquidators or lawyers of the company with positions within two years before the insolvency declaration.

   c. Subsidiaries of the company and their shareholders.

4.6. Italy

The Italian insolvency law has evolved significantly over the last ten years and has shifted the focus from "punishing" the company to encouraging the rehabilitation. The insolvency code is laid out in the Bankruptcy Act of 1942 amended in 2003 and 2004 by the *Manzano* Law. Since then, several amendments have been taking place including the popular claw backs.

The insolvency proceedings in Italy are:

- Liquidation proceedings (*fallimento*).
- Compulsory administrative liquidation.
- Reorganization plan (Article 67).
- Debt Restructuring agreement.
- Pre-bankruptcy agreement.
- Bankruptcy agreement (*concordato fallimentare*).
- Extraordinary administration (*Prodi and Manzano*).

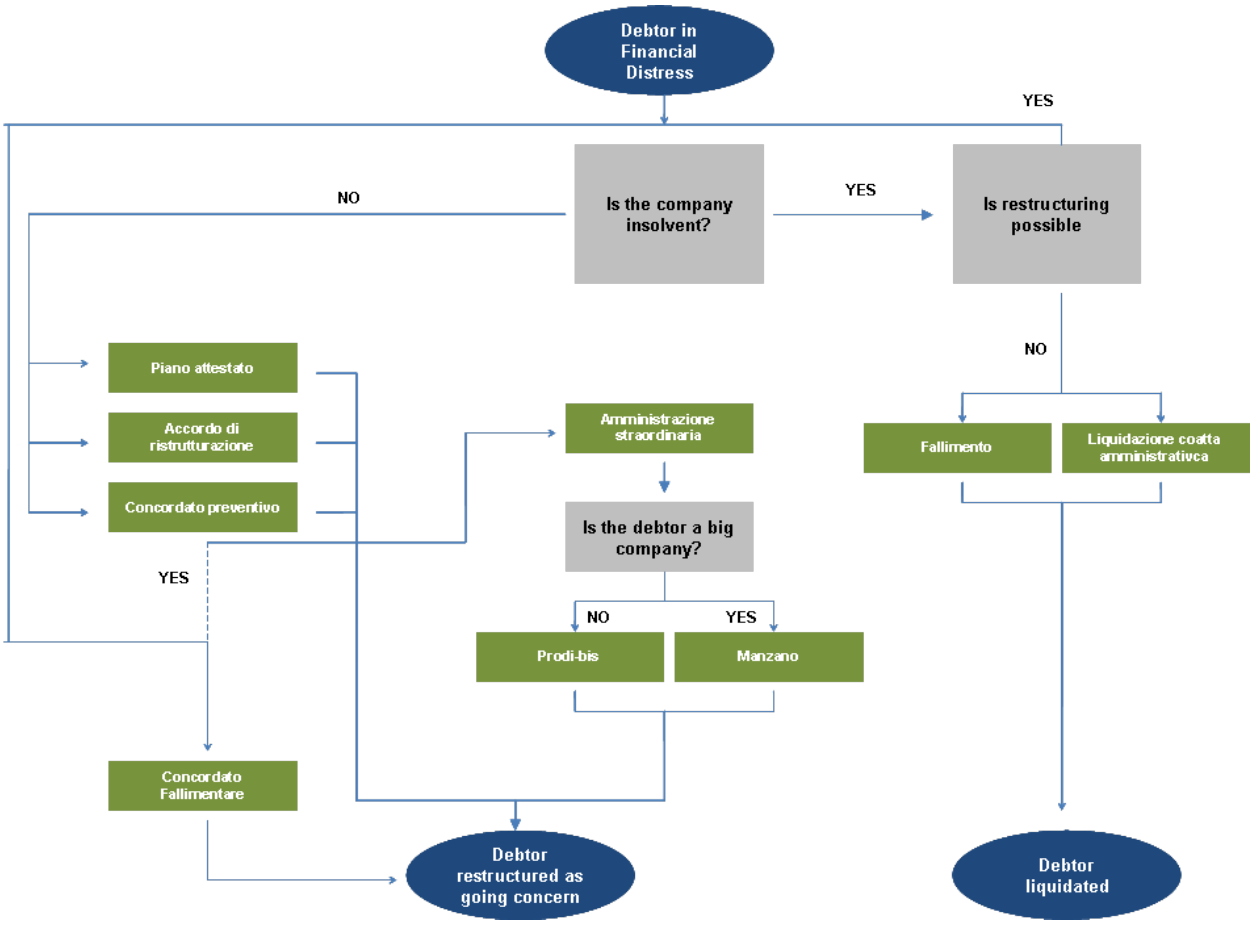
The Italian law states that insolvency is the inability to meets its obligations in an ordinary manner. Additionally, it regards other situations as insolvencies such as the sale of assets below the market price to raise cash or when the company pays its creditors in an untypical manner such as the payment in kind (PIK). Director might face criminal liability if the company incurs in losses instead of declaring the insolvency.

The main type of securities for immoveable assets is the mortgage and for the moveable assets is the pledge. The latter includes a *pegno rotativo* (revolving pledge) which is usually attached to shares and resembles the floating charge type of UK security. Set off is available.

The court managing the insolvency is the court of first instance based in the area where the company has its centre of interest.

Below, a summary of the Italian bankruptcy proceeding.

Figure 11: Italian Bankruptcy Regime



Source: Nomura (2010); author analysis

4.6.1 Pre Insolvency

Companies have the liberty to negotiate an out of the court restructuring agreement with its debt and equity holders provided there is enough unanimity. There is also a possibility that all these agreements are clawed back at a later stage. However, Italian law offers some pre insolvency proceedings that help

the companies to reach agreements.

4.6.1.1 Reorganization plan (Article 67 of the Bankruptcy Act)

The *piano attestato* (reorganization plan) is a quick, confidential and out of the court whose aim is to rehabilitate the company. It spins around the restructuring plan proposed by the company which has to be validated by a field expert appointed either by the company or by the court. This proceeding has the advantage of excluding payments and acts from future claw backs. It is only binding to those creditors that have accepted the plan and hence there is no cramdown to other creditors.

4.6.1.2 Debt Restructuring agreement (Article 182)

The *accordo di ristrutturazione* (debt restructuring agreement of the Bankrupcty Act) can be thought of prepackaged restructuring proceeding since the plan is agreed between the company and its creditors to be implemented after the court approval. The first stage is for the company and the creditors to agree on a plan that is validated by the independent expert through a report. Then, creditors have one month to contest it or raise objections. Then the court approves or rejects the plan.

There is a 60 days automatic stay beginning once the publication of the plan has been registered (in the *registro delle impresse*). However, a new law permits the stay to start before the agreement has been reached provided the petition has been filed in the court and proves that the agreement is underway with at least 60% of the creditors in the negotiation. In this framework, the plan has to be approved by at least 60% of the creditors by value. The law also contemplates super senior loans as long as they are ratified by the court (Nomura 2010).

In both procedures, super senior lenders are not included in the majorities required to approve the plan.

4.6.1.3 Pre Insolvency agreement

The *concordato preventivo* (pre insolvency agreement) is a proceeding for companies in a financial crisis which begins with the debtor filing a plan in the court and validated by a report from an independent export. Then, the court decides on whether the company is meeting the conditions to file and then the proceeding is opened. There is an automatic stay on all securities that usually lasts until the end of the process. A commissioner is appointed to engage with the creditors, to keep them apprised of the details of the plan and the date of the hearing. Management stays in control under its supervision.

The law allows for the segmentation of creditors into different classes. At the creditor's meeting, the plan has to be voted by the majority of creditors or by all classes of creditors and then becomes binding to all. Therefore, there is a cramdown on all those creditors that do not support the plan.

Priority claimholders are not entitled to vote unless they waive their right of priority. There is a provision in the law to impair the secured creditors as long as they receive no less than the market value of the secured assets and are not unfairly treated versus the unsecured ones. All transactions undertaken during the court approved program cannot be clawed back.

Super senior loans are also permitted provided they are approved by the court and they are not included in the majorities for the approval of the agreement by the court.

The pre insolvency agreement proceeding has to end within the six months (possible 60 days extension) of the filing date or otherwise the company could be declared bankrupt.

4.6.2 Post insolvency liquidation

There are two main liquidation processes:

4.6.2.1 Liquidation proceedings

The *fallimento* (liquidation procedure) is used to wind up a company in such a way that looks after the rights of the creditors and removes the company from the market. This procedure can be initiated by the company, creditors or a public prosecutor. This proceeding is only applicable to companies of a certain size in terms of assets, revenues and indebtness. Once the court verifies the company is suitable for bankruptcy procedures, management is removed from the company. The company is then taken over by a trustee and supervised by the court and creditors appointed by a judge which represent all types of claims.

There is an automatic stay on all securities enforcement allowing the trustee to initiate the clawback process unless the counterparty proves that it did not know that the company was insolvent. All transactions carried out throughout the restructuring process are not usually clawed back.

The trustee is tasked to liquidate the assets or sell the debtor as a going concern.

4.6.2.2 Compulsory administrative liquidation

The *liquidazione coatta amministrative* (compulsory administrative liquidation) only applies to supervised firms such as insurance companies and banks. It can be initiated by the company, creditor or a public prosecutor and the court opens the process if the company is found insolvent.

The management is removed and the company ceases its business. There is an automatic stay on all enforcements. A liquidator is appointed and in charge of informing all creditors about the size of its claims. The liquidator presents a plan that is subject to creditors' approval and can be either a liquidation or restructuring. If the plan is rejected, debtor's assets are sold and all proceeds distributed according to the priority order

4.6.3 Post insolvency restructuring

We distinguish two different restructuring processes

4.6.3.1 Bankruptcy agreement

The *concordato fallimentare* (bankruptcy agreement) is supervised by a court and it is only applicable after the bankruptcy declaration. Creditor or other third parties can initiate presenting a plan during bankruptcy procedures. Management is removed and a trustee takes over.

The plan has to be approved by the majority of the creditors or otherwise, if needed, from the majority of creditors classes. Once the plan is taken forward, it becomes binding to all creditors and therefore there is a cramdown on the minorities (Gilson 2000).

4.6.3.2 Extraordinary administration

The *amministratione straordinaria* (extraordinary administration) is a restructuring process for big insolvent companies which has two ways:

- *Prodi's law* for companies with a more than 200 employees and total financial leverage of more than 2/3 of the assets and more than 2/3 of the revenues of the last fiscal year.

- *Manzano's law* applying to companies with more than 500 employees and financial leverage above €300mn.

Both regimes can be used provided that the company proves the viability of the business through either the sale of the business in a year or a rehabilitation plan in less than two years.

We briefly describe now the *Manzano* procedure. To begin the procedure, the company must apply to the Minister of Economic Development and the assigned court. The Minister supervises all the proceeding. The Minister then decides to take this procedure forward and keeps the court well informed about his decisions. A commissioner is appointed by the Minister who is in charge of proposing a financially restructuring plan to the Minister over the next 3 months.

There is a stay on all enforcement carried out by creditors, both secured and unsecured and the commissioner can initiate claw back anytime. He also replaces management. New debt raised over the proceeding is granted with privileged status and ranks as *credito prededucibile*.

The rehabilitation plan must be approved by the Minister and by the majority of the creditors or by the different classes becoming binding to all creditors ie crawdown on dissenting creditors

4.6.4 Priority of payments

The ranking is as follows:

1. Super senior claims (fees and expenses associated to the proceeding) and other supported by the law (*crediti prededucibli*) including the post insolvency debt and the 80% of the shareholder's loans within the debt restructuring agreement and the pre insolvency agreement.

2. Privileged claims of government for judicial expenses.

3. Secured claims.

4. Pledge or mortgage secured claims.

5. Unsecured claims.

4.7 Ireland

The Irish Insolvency law is articulated through the Companies Acts 1963-2006. Recently it has been supplemented by case law. The main proceedings are:

- Creditors' voluntary winding up.

- Compulsory court liquidation (official liquidation).

- Receivership.

- Examinership.

- Schemes of Arrangement.

Let us go over them a little more in depth.

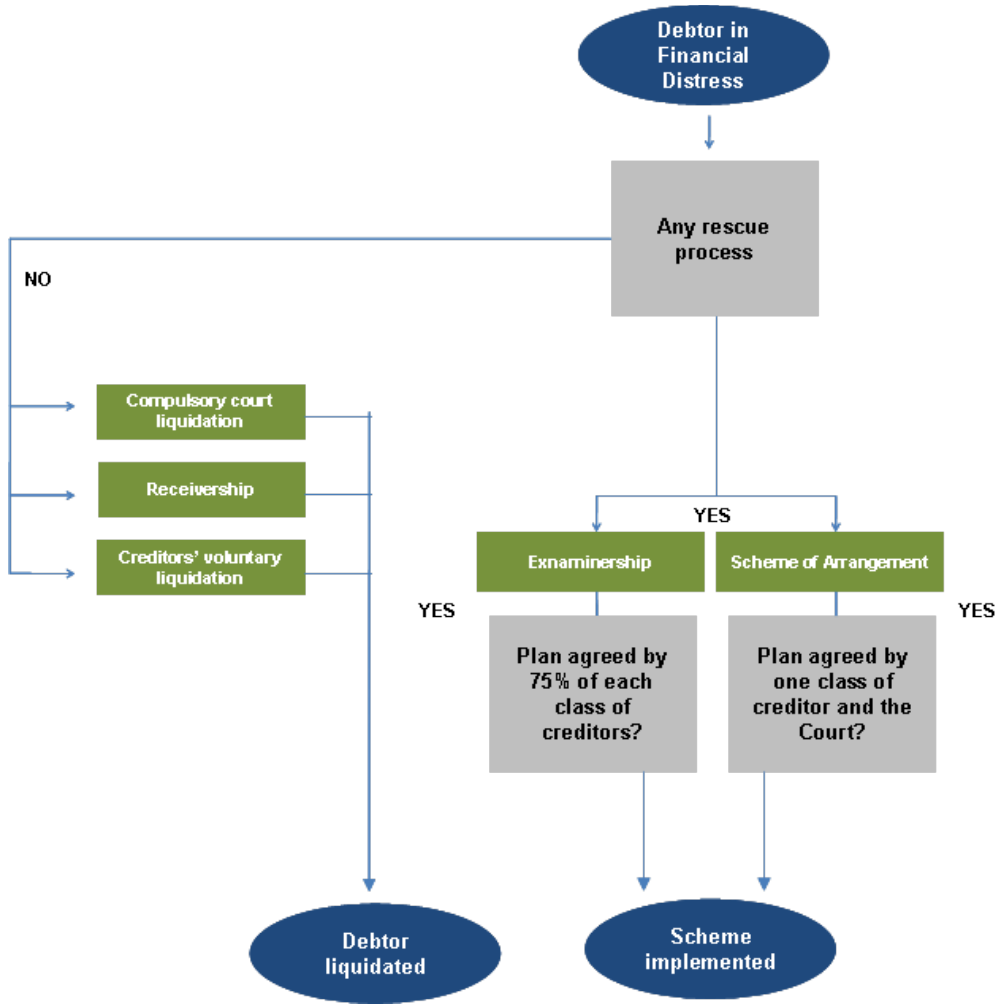
In Ireland, it is the High Court and Supreme Court of Dublin who manage the insolvency procedure in Ireland even though it can be sometimes conducted by the Circuit Court. Immoveable property can only be secured by fixed charge as a 2009 act removed the mortgage as an immoveable property based security. The Irish insolvency law also provides for floating charges that can be attached to both an immoveable or a moveable assets but has less seniority than the fixed charge. Lien and pledge are also common securities for moveable assets.

Insolvency is defined twofold: balance sheet test looking at whether the value of liabilities exceeds the value of assets and a cash flow test asking if the debtor can pay its debt as it comes due.

Management will not be held guilty if they are found to be running an insolvent company under the belief that they can overcome the financial difficulties. If they are found guilty, then they can be suspended from becoming directors of another company for up to 5 years and also face criminal charges for that.

Below, a summary of the Irish bankruptcy process.

Figure 12: Irish Bankruptcy Regime



Source: Nomura (2010); author analysis

4.7.1 Pre Insolvency

In general Irish law does not contemplate exclusively formal pre insolvency proceedings. The main procedures address insolvent or close to insolvency companies.

4.7.2 Liquidation procedures

There are three main liquidation proceedings:

4.7.2.1 Creditors' voluntary liquidation

This is an out of the court proceeding in which directors believe the company is not able to pay its debt and apply for a winding up resolution. This proceeding is independent of the court. To initiate the proceeding, an extraordinary general meeting must pass the resolution and at the same time hold a meeting with creditors. At this meeting, a liquidator is appointed and management is removed. There is

no stay. The liquidator then disposes the assets and distributes the proceeds in line with the priority of payments.

4.7.2.2 Compulsory court liquidation

It is a court-led liquidation proceeding. It can be initiated by the debtor or the creditors. To commence the procedure, the claiming party has to apply it to the High Court resulting in a more lengthy and expensive procedure than the previous one. Throughout the process, creditors are not allowed to enforce their securities unless permitted by the High Court. Fixed charge secured assets are not included within the liquidation fund. Creditors with large debt in the company are usually advised to hire a receiver to dispose their secured assets as the liquidator charges a 4% tax on all assets.

4.7.2.3 Receivership

This proceeding is characterized by the appointment of a receiver by secured debt holder to dispose his assets. This receiver is tasked with selling these assets at the best price for the creditors. This procedure is not a formal collective insolvency proceeding. Once the receivership has been operating for more than 3 days, an examinership restructuring cannot be initiated upon the company. Under this scheme, secured creditors enjoy a great deal of power as they appoint a receiver to shorten the period to enforce their securities as opposed to the more lengthy examinership procedure

4.7.3 Restructuring procedures

4.7.3.1 Examinership

This rehabilitation procedure was incorporated in the Company Act 1990 to help the companies cope with financial difficulties to pay off their debt. To enter in this proceeding, the company must have a reasonable chance to be rehabilitated as a going concern (Nomura 2010).

To initiate this proceeding, a formal petition has to filed to the High Court by the company, directors, creditors or even employees than own at least 10% of the voting capital. This petition has to be supported by a official report from an accountant stating that the company has a good likelihood to emerge from the examinership as going concern.[11]

During this procedure, there is a stay on all creditors giving the examiner enough time to look into the company and evaluate the likelihood of the company to come out of the proceeding as a going concern by formulating a scheme of arrangement. The latter usually engages an investor willing to buy the assets along with a “haircut” of debt across the whole capital structure. The examiner has between 70 to 100 days (the duration of the stay) to come up with a plan to convince shareholders and creditors to agree on the scheme of arrangement. The examiner is also allowed to all fixed and floating charge attached assets as long as they are not crucial for the survival of the company.[12] However, he has to count on the court approval or the affected creditors. Fixed charge assets proceeds are used to repay the debt whereas the floating charge ones entitle the creditors to have a charge over the sale’s proceeds.

[11] If the accountant document is not available upon filing petition, the court might appoint an examiner for up to 10 days until the report is delivered.

[12] It can also sell the assets attached t o lease finance agreements, or retention of title claims.

To take the scheme forward, the examiner must hold meetings with every single class of creditors and shareholders. The former are divided into different classes (secured, unsecured, preferential creditors, employees etc) and vote in their committees. The voting mechanism is by value and number.

Should at least one impaired class of creditors accept the scheme, the examiner can apply for it to the court and makes it binding to all creditors, including the dissenting ones, so there is some sort of cramdown.

If the scheme is not approved by at least one class of creditors or is rejected by the court, a liquidator or receiver is appointed to initiate the winding up of the company. Recently, the procedure has been used to implement a pre pack.

4.7.3.2 Scheme of Arrangement

The Irish law also includes a scheme of arrangement to help achieve an agreement between the company, creditors and shareholders. To initiate, a petition has to be filed to the High Court by either the company or the creditors and counts on a majority in number and 75% in value of the creditors. There is no automatic stay. It lies at the court discretion reason why this scheme is not as usual as the examinership.

4.7.4 Priority of Payments

The priority of payments is as follows:

1. Examiner's costs, remuneration and expenses.

2. Payments to holders of fixed charges.

3. Approved, certified expenses due to creditors which were incurred during the examinership period.

4. Costs and winding-up expenses.

5. Fees due to the liquidator.

6. Some social insurance contributions7. Preferential debts (employee liabilities and other taxes such as VAT, corporation and income tax).

8. Payments to holders of floating charges.

9. Unsecured creditors.

5. Country comparison

Having explained in detail each country insolvency framework, we now conduct a country to country comparison to better grasp which regimes are more secured or unsecured creditors friendly, which regimes aim to preserve the value of the business whilst the debt is restructured and which regimes attempt to reach a fair restructuring agreement.

5.1 Liquidation procedures

To make a comparison of the liquidation processes, we look at the different priority of payments. The most important difference among regimes is the priority given to:

- Secured creditors.
- Insolvency related expenses (legal, administration, etc).
- Employee wage claims and pensions.
- Post insolvency debt.

Based on the table beneath, we can draw the following conclusions:

1. *Secured creditors* are placed at the top of the priority ranking in England and Wales and Germany. In these jurisdictions, the secured creditors do not even contribute to the liquidation expenses or employee wages. On a *ceteris paribus* basis, their recovery should much higher than those of other regimes.
2. *Employees* are ranked first in France and Spain and to a lesser extent US that grants some priority over secured claims. These jurisdictions regard the employees as stakeholders whose rights have to be upheld.
3. Insolvency proceedings related *expenses* are ranked at the top in Italy and Spain. These are the jurisdictions where the creditor's recovery is very much subject to the amount of fees and expenses of the liquidation.
4. Some regimes, especially US but others such as Germany, France, England and Wales and Italy, provide for some *post insolvency financing*.

	Order of Payments						
US	Post insolvency financing	Insolvency procedure expenses, certain taxes	Limited wage claims	Secured claims	Unsecured claims		
England and Wales	Secured claims with fixed charge	Insolvency procedure expenses and post insolvency financing	Employee wages and pension rights	Limited fund for unsecured creditors	Secured creditors with floating charges	Unsecured creditors	
Germany	Secured claims	Insolvency procedure expenses, post insolvency financing and pre insolvency contracts claims	Unsecured claims				
France	Employees wages	Insolvency procedure expenses and post insolvency financing	Post insolvency financing (conciliation process)	Secured claims	Post insolvency claims	Pledges without retention rights	Taxes, unsecured claims
Italy	Insolvency procedure expenses and post insolvency financing	Privileged claims of government for judicial expenses	Secured claims	Unsecured claims			
Spain	Insolvency procedure expenses, post insolvency financing and wages	Secured claims	Limited employee wages, taxes and 25% of the claims of first creditor to file for insolvency	Unsecured claims			
Ireland	Insolvency procedure expenses	Secured claims with fixed charge	Other costs and expenses	Taxes	Secured creditors with floating charges	Unsecured creditors	

Source: author

5.2 Rehabilitation procedures

All regimes pursue the same objective, either a restructuring of the debtor as a going concern, or an orderly and fair liquidation, the details of each procedures differ significant between each other. We look at the main criteria for a comparison analysis:

- The situation for entry in the proceeding.
- The stay.
- Who has the control over the proceeding.
- The level of majority to have the rehabilitation plan approved.
- Cramdown.
- Post insolvency financing.

Needless to say, this is not an in depth list but aims at capturing what we consider the key difference among the different jurisdictions. The table below displays the main restructuring procedure in each regime.

- *Entry condition*: most jurisdictions impose that the company be insolvent before it can apply for any restructuring proceeding. In US and Italy, the company can be solvent and be eligible for a restructuring procedure. In France on the contrary, the firm must be solvent.
- *The s*tay: most countries provide for a stay on unsecured creditors. in US is automatic. In some other cases, the court must grant the stay. In some other regimes, the stay is also extended to secured creditors. For instance in UK, only the administration out of the three formal procedures, has a stay on all creditors enforcements.
- *Control*: most of the regimes keep the management when the company enters the restructuring procedure except for Germany, England and Wales that removes the management
- *Voting level*: the threshold of agreement between creditors to approve the plan can take very different forms. The main condition is that it has to be a majority in terms size of claims and numbers of creditors. This is the requirement for Germany, Spain and England and Wales. In US, and France, this minimum levels increases to a 2/3 majority by value. The most demanding ones are the UK scheme of arrangements and CVA procedures with 75% and 75.1% respectively. By all means, the higher the threshold, the more difficult it become for the plan to go ahead.
- *Cramdown*: only US has a comprehensive cramdown law whereby the court can overrule or ignore the dissenting creditors provided they have not been treated unfairly and the absolute priority rule is respected. Some other jurisdictions have softer versions of that where dissenting creditors vote all in the same class. As Nomura (2010) says, the English scheme of arrangement cramdown can be regarded as cram-in where the majority of creditors in a class can bind the dissenting creditors. Cramdowns are also allowed in Germany, Spain and France but the lack of comprehensiveness in the implementation have inherent risks for all stakeholders

- *Priority post insolvency loans*: the grant of the priority status to the post insolvency financing is becoming more common in many jurisdictions. It is the case in US, England and Wales, France, Germany, Spain and Italy. Nonetheless, the rank in priority list varies across each country. In UK or instance, these post insolvent loans are only senior to the floating charge and unsecured credit.

6 EU insolvency regimes

Since the EU was created, there have always been discussions over the insolvency law to be applied in companies with interests across different EU countries. This situation encouraged companies to look for the best insolvency regimes in Europe to protect their rights (the so called “forum shopping”).

To set out some basic rules to govern the cross border insolvencies, the EU implemented the EC Regulation on Insolvency Proceedings 2000 in 2002 which refers to all members except for Denmark. This law is not meant to put all insolvency regimes under the same umbrella but to let the each country to embrace the insolvency framework of other EU countries. This regulation only rules the collective insolvency proceedings and leaves out the informal or private proceedings as well as the insolvency on credit institutions and insurance companies (O’Kane 2010).

This new EU law sets out two layers of insolvency procedures:

- *Main proceedings*: the insolvency procedure must be governed by the country insolvency law. To accomplish so, main proceedings and their effects in the country in which the procedure is opened, are recognized across the EU.

- *Secondary proceedings*: they can be implemented in any EU country in which the company has enough presence but in some instances they are subordinated to the main proceedings.

The main proceedings are opened in the country where the debtor has its centre of main interest (COMI). The regulation sets out two main requisites to identify the COMI: it is thought to be the location of the registered office unless proven otherwise; it should be the location where the company manages the administration of its main interests. However, these two criteria have somehow turned out to be a bit vague which has allowed the companies to move the COMI to other more favorable jurisdictions. In some instances, it has been up to the local courts where the main proceedings are opened to solve situations in which the location of the registered office and the location where the company conducts the administration of its interests are different.

The pivotal point of the new rule is to enable the company to open its main proceedings in the countries where the COMI is based and therefore, the first party to call the main proceedings assigns the state which will conduct the process (the so called “first mover advantage). Appeals by other parties attempting to open the proceedings in other countries are ultimately heard by the European Court of Justice

Secondary proceedings are usually opened in a non COMI country and concerns over the liquidation of local subsidiaries or the disposal of assets. The prerequisite is that the company has an “establishment” in the country. These proceedings can be opened by the office holder in the main proceedings or by creditors for instance under most of the European Insolvency laws (Jefferies 2003).

This new EU regulations allow to manage the insolvency of a company registered in a EU country but operations EU wide. This regulation aims at companies at an entity level and not at corporate groups with

a holding company in a EU country and subsidiaries in other markets. In this case, each entity has its own COMI. This might result in each entity with its own main proceedings in a different EU member.

In spite of this rule being aimed at reducing the forum shopping, we have witnessed many companies moving their COMI to UK to benefit from its wide range of insolvency proceedings.[13]

Companies then seek to locate their COMI in a favorable jurisdiction. Creditors must be aware of that and negotiates adequately the "COMI covenants" in the credit documentation. According to Nomura (2010), elements which underpin the COMI status are: it has the registered office and is incorporated there; operations and assets are based there; board meeting are held there; creditors' meeting take place there; funding and finance are supplied there.

[13] It must be noted that EU insolvency regulations exclusively apply to collective insolvency proceedings. In UK, this includes the CVA, administration and mandatory winding up but no schemes of arrangement.

`	Restructuring Proceeding	Entry Condition	Stay	Control	Voting Threshold	Crawmdown	Priority of post insolvency loans
US	Chapter 11	None	Yes, automatic and comprehensive	Management	50% by number and 66.7% by value	Yes	Yes
England & Wales	Scheme of Arrangement[1]	None	No	Management	Majority in number and 75% by value	Yes	No
	Administration	Insolvent	Yes, automatic and comprehensive	Administrator	50% by value	Yes	Yes
	CVA	None	No[2]	Management	More than 75% by value	Yes	No
Germany	Insolvency plan	Insolvent	Not automatic for preliminary period. Stay automatic when main proceedings open. Not comprehensive	Insolvency Administration[3]	50% in number and value	Yes, subject to some conditions on fairness	Yes, but only preferred creditor status
France	Safeguard	Solvent company facing financial headwinds	Yes, automatic and comprehensive	Management	66.7% by value of two committees	Yes	Limited
Italy	Extraordinary Adminstration	Large company insolvent	Yes, comprehensive	Judge/government appointed commissioners	Tribunal approval	Yes	Yes
	Restructuring Agreement	None	Yes, comprehensive[4]	Management	60% by value	No	Yes[5]
Spain	Anticipated Creditors' Agreement	Insolvent	Yes, only on unsecured creditors	Management	50% of unsecured creditors	Yes	Yes, but limited
Ireland	Examinership	Insolvent	Yes, only on unsecured creditors	Examiner	At least 50% by number and value in at least one class	Yes	No

(1) We choose this as the most similar procedure to Chapter 11. (2) Except for smallcompanies. (3) It is possible but unusual for self-administration to be allowed in which case management stays in control but this is the exception rather than the rule. (4) After petition has been filed with a bankruptcy court informing it that restructuring talks are under way with the creditors representing at least 60% of the total credits. (5) Recent revisions in the code allow for loans provided by banks and financial institutions to have priority status.

Source: author

7 Conclusions

To many practitioners, the US insolvency law is predicated on the idea that it is better to rehabilitate distressed companies and preserve their value rather than filing the company for liquidation to pay off the creditors. Chapter 11, by far the most popular bankruptcy framework, is both creditor and debtor friendly. It is debtor oriented because management is allowed to stay in the company and push for a restructuring plan through. It is also creditor friendly because of the strong involvement of senior and junior creditors in the process under a tight control by all stakeholders. Chapter 11 attempts to maximize the chances of the company to emerge as a going concern whilst it aims to look after the rights and the economics of all creditors, regardless of the class.

All major jurisdictions (Germany or France) have felt the influence of the US bankruptcy law in order to enhance their rehabilitation proceedings but they still lack the consistency and success of a framework which has been active since 1978. Market participants have already tested the framework throughout this period and they are aware of the advantages and disadvantages providing significant clarity on the process which might[14] lower the overall risk premium and financing costs (and hence the WACC) for distressed companies heading into Chapter 11.

The England and Wales procedures are very comprehensive and bespoke. However, to fully benefit from these schemes one needs to understand the restructuring, the creditors and the intended agreement. It is definitely a case by case basis. Administration is not usually a helpful rehabilitating procedure as management is replaced and the stay is not as thorough as that in Chapter 11. However, it has been lately used as pre pack sale where the rehabilitating agreement has been reached before the company enters administration allowing management to transfer the assets to the administrator who will look to sell them. CVA is not a common restructuring framework as it cannot bind secured creditors without their consent (Frye 2002). Nonetheless it is a helpful tool to restructure the debt since all unsecured creditors vote as one making it easier than the scheme of arrangement. The latter has traditionally been used by large restructuring corporations. This proceeding allows management to stay in the company, bind dissenting secured creditors and reasonably rid itself from *out of the money* creditors enabling the company to normally operate and restructure its capital structure. The court does not significantly engage in the process (unless disputes prompt them in) and keep insolvency related fees low as the process usually takes less than 3-4 months. Overall, all the proceedings are still “imperfect” versus Chapter 11 as the stay is not as comprehensive, there are constraints for the administrator to secure super priority financing and cramdown on dissenting creditors is not as obvious as in Chapter 11.

In Germany, despite the implementation of the new insolvency law more prone to rehabilitation, distress companies have usually followed the winding up path where the recovery for creditors is usually prioritized before the restructuring of companies. It is striking given the enhancing features of the new legislation including the stay or the cramdown framework The out of the court restructuring are not very common given the company needs full agreement with its creditors. Additionally, management is bound by law to file within the first three weeks of the company becoming insolvent and thus restraining them to find the adequate plan to rehabilitate the company. This is the main reason why German companies transfer their COMI to jurisdictions such as UK to apply for out of the court proceedings (scheme of arrangements).

[14] The purpose of our thesis.

France's insolvency law has traditionally been considered a debtor friendly proceeding as a result of the long stay and the limited power by the creditor through the insolvency process. However, new steps such as the safeguard procedure has boosted creditor rights and allowed them to exert more influence in the process.

The Italian bankruptcy law stands out as a complex one with many procedures which have undergone several amendments to render them more restructuring oriented. It is regarded as fairly debtor friendly due to the long stay on secured creditors. However, proceedings such as the extraordinary administration for large companies see the management leaving the company for an administrator.

Spain is a different story versus some of its western peers. The new insolvency is hardly used and restructuring is usually undertaken on an informal and out of the court basis. There seems to be some weak knowledge of the insolvency law. Banks are obliged to provision against future losses during the insolvency procedure. Furthermore, banks are usually the main providers of financing for corporates on a secured basis making the recovery fairly high in a liquidation scenario discouraging them from supporting any corporate rehabilitation. The new laws are also quite lengthy in general extending the insolvency process several months (even years) which gradually erode the value of the company and hence the recovery for creditors.

Finally, Ireland is a secured creditor friendly jurisdiction. The stay is usually short and secured creditors can resort to a receiver to enforce their securities and avoid the court. It also includes restructuring oriented proceedings such as the examinership that offers a maximum of 100 day period stay from creditors as well as a cramdown mechanism. This process is quite fast and in the even of failure a liquidator/receiver is appointed. This procedure has been extensively used by companies and become very familiar amongst creditors and lawyers.

In our empirical model in section 3 we will seek to validate our theoretical thoughts over these bankruptcy proceedings under the distressed cost of capital framework and support the *Chapter 11 efficiency thesis.*

SECTION 2

There is plenty of literature about the cost of capital but very little theoretical and empirical research about the impact of distress on the WACC. A distress corporate deal is intricate by its own nature due to the several moving parts that interplay with each other (credit and operating creditors, shareholders, management etc). The agency cost and the asymmetry information is very significant (Myers, Majluf 1983) as the management have information that the rest of the other counterparties do not. Management do know whether the company is worth the restructuring/liquidation whereas the rest of the parts remain in the "dark" until management takes an action. And even during the restructuring process, management enjoy a privileged information that gives rise to under/over investment / debt overhang problems (Modigliani/Miller, 1963) and investors do not hold the information to make the right decision[15]. Additionally, each restructuring regimes has its own bias towards restructuring (from the debtor friendly Chapter 11 to the credit friendly UK restructuring code) which challenges the dichotomy between the shareholders' vs the stakeholders' approach[16]. During a restructuring several outcome determine the fate of the company. In some instances management is remained in place and still pursues the traditional dual profit/market value maximisation (Modigliani/Miller 1959) but in some other cases, they just want to survive somewhat and they just look after their own interests (adverse selection; asymmetric information). In some other instance, management is removed, a special team is placed on board and then the rehabilitation tends to look out for all stakeholders rights by maximizing the overall value of the company. More than in any other case, agency costs are real (Jensen/Meckling, 1976) and represent huge costs in distress. Whether the company needs new debt or new equity from current or new investors is only objectively assessed by the management who holds insider information and knows the fate of the firm. Investors are just players in a game with many outcomes (Stern 2006).

Another interesting topic is that the restructuring process aims to maximize the value of the firm and this is consistent with efficiency (Jensen/Meckling, 1976). This is what we attempt to determine in our empirical exercise. To what extent, the market prices based WACC captures the efficiency of the rehabilitation framework of the company that is supposed to maximize the value of the company. If the company is rehabilitated, its value has been maximized for all stakeholders. Otherwise, the firm should be liquidated and the proceeds be distributed to the senior creditors whose collateral has a claim on the company assets. It is interesting how the traditional theory of the cost of capital bodes well with our empirical analysis on the Distressed WACC and how the agency costs and the asymmetric information are exacerbated during the restructuring process.

We first briefly outline the theoretical underpinning of the cost of capital decomposing its main factors which will enable us to conduct our empirical exercise, the cornerstone of this section.

[15] Somehow it is a game theory problem.

[16] The former is predicated on the protection of the shareholders' interest and the latter on the protection of the interests of all stakeholders as a whole.

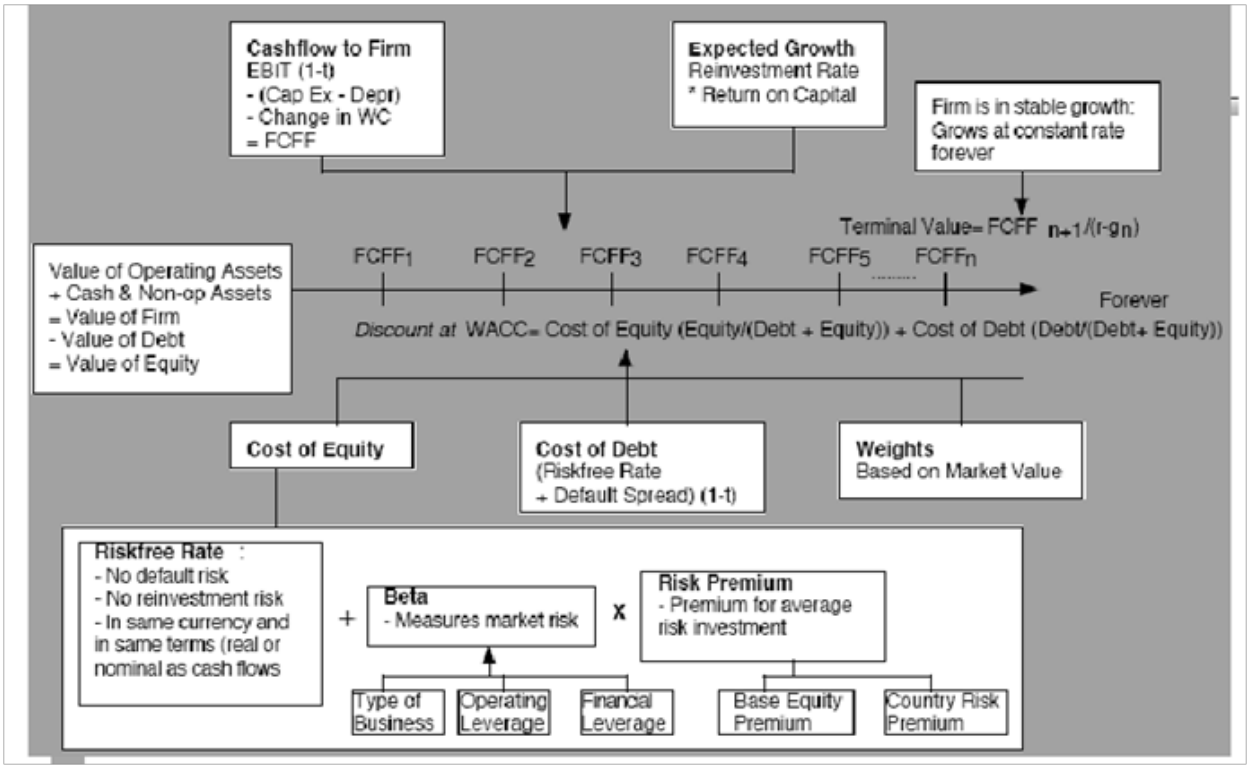
1 The Weighted Average Cost of Capital (WACC)

The Weighted Average Cost of Capital (WACC) is a key concept in Corporate Finance. It is used as an estimation of the price that the company pays for holding capital in its business. It is the rate that a company is supposed to pay on average to all its security providers[17] for financing its assets.

It is also used as a discount rate to find the NPV of the expected free cash flows generated by the assets of the firm to calculate the value of the firm (Sharpe 1964).

Below a summary of the WACC as a discount rate within the discounted cash flow valuation framework.

Figure 13: Discount Cash Flow Valuation



Source: Damodarán (2005)

Below the WACC formula (Farber 2006):

$WACC = D / (D+E+Pe)*r_d(1-T) + E / (D+E+Pe)*r_e + Pe / (D+E+Pe)r_{pe}$

D = Market Value of debt

E= Market Value of equity

Pe = Market Value of preferred equity

[17] Common and preferred equity, senior and junior debt etc.

r_e = Cost of equity

r_d = Cost of debt

r_{pe} = Cost of preferred equity

t = Corporate Income tax rate

Generally speaking, a firm's assets are financed through equity and debt. WACC is the weighted average cost of these financing sources, each of which is weighted by its use at any point in time. By weighting the average, one can see how much the company is paying for every dollar it finances.

Our mission here is to thoroughly explain the market price based WACC as the more realistic and accurate WACC for trading companies in general and distressed firms in particular. We will see how distorting and inaccurate book based WACC could turn out to be for distressed companies.

1.1 Major pitfall in the academic WACC

The capital weights that we use to estimate the WACC obviously affect the result. Academics tend to focus exclusively in the debt and equity instruments and treat hybrids (preferred stock, mandatory convertible bonds, Tier 1 bonds, etc) as either pure equity or debt and assign the same rate of return. This is the first pitfall. Equity like instruments are of different nature relative to the common equity and so are the expected returns and therefore hybrids should be accounted for separately within the cost of capital.

Once we have broken down the capital structure between equity, hybrids and debt, we come up with the weighting. One weighting source could be the total amount of these three financing holdings in the balance sheet. We could calculate the weights by determining the amount that each source represents in the overall capital structure. Academics and practitioners tend to use the book value instead of the market value. This is the second pitfall.

The main problem with book value weights is that the balance sheet capital sources are historical and not based on current market values[18]. This is even more relevant in distressed companies trading for instance at discount to book / NAV[19] given the expected recovery of the equity is lower than the amount recorded in the balance sheet. The market continuously calculates the value of each capital source at any given point in time so market values are more accurate and appropriate. The calculation of market value weights is similar to that of book value weights but we must first estimate the market value of the capital sources which is, in some instances, an intricate process.

It is then very important to always use market values or at least a proxy of the implied market value. The main reason is that book values show the historical amount of securities placed in the market whereas the market values show the current amount of outstanding securities in the market.

[18] Book value is acceptable in some circumstances if the value was recorded when interest rates were similar to today or the credit rating of the company was similar.

[19] NAV: Net Asset Value; meaning that the equity is worth less than the value booked in the balance sheet

In our sample in section 3 of our thesis we have used public companies so it is fairly straightforward to get hold of the market value of equity, which is the market capitalization[20]. For the debt and hybrids is become a more difficult task as:

- There are no historical prices of debt in any database at the time.
- Some company's bonds or other form of debt such as commercial paper, revolving credit facilities or senior debt do no trade in the market.

To estimate market values is always a challenging process but we still prefer to estimate the market value of the financing sources rather than relying on the book values. We will lay out our assumptions and methodologies to fairly estimate market values for the different WACC components.

1.2 Market Value of debt

There are three approaches to estimate the market value of debt

1.2.1. Probability of default

We adjust the book value of debt for the probability of default by using S&P historical cumulative probability of default for American corporates (Damodaran 2005).

$$Dmarket = Dbook * (1-Pd)$$

being the Pd=Probability of default.

EBIT Interest Coverage	Estimated Bond Rating	Cumulative prob of default 1 year	5 years	10 years
>8.50	AAA	0.00%	0.28%	0.67%
6.50-8.50	AA	0.02%	0.45%	1.08%
5.50-6.50	A+	0.05%	0.61%	1.46%
4.25-5.50	A	0.07%	0.60%	1.73%
3.00-4.25	A-	0.07%	0.73%	2.12%
2.50-3.00	BBB	0.23%	1.95%	4.44%
2.00-2.50	BBB	0.81%	8.38%	14.62%
1.75-2.00	B+	2.53%	17.65%	26.11%
1.50-1.75	B+	6.27%	23.84%	30.43%
1.25-1.50	B-	9.06%	29.44%	35.73%
0.20-1.25	CCC/C	25.59%	44.50%	49.76%
<0.20	D	100.00%	100.00%	100.00%

Source: Moody's (2007) and author

[20] Adjusted for the preference shares.

1.2.2. Bond approach

This approach consists on converting the book value of debt into market value by considering each tranche of debt in the balance sheet as a coupon bond with a coupon set equal to the interest of the debt instrument and then value this coupon bond at the cost of debt of the company at the time. Once we have the market values of the different debt instruments, we calculate the weighted average to come up with the debt weighting in the capital structure. We stick to the same rationale to estimate the market value of the hybrids. Then

Market value of debt = Interest expense*[(1-(1/(1+cost of debt)^^{maturity}) / cost of debt] +Book value of debt / (1/(1+cost of debt)^^{maturity}

This is the method that we will use in our empirical analysis.

1.2.3 Merton Model

This model aims to assess the credit risk of a firm by featuring the firm's equity as a call option over all its assets (London Business School 2008).

Let E_t be the equity value at date t, D_t the debt value, V_t the enterprise value, F the face value of the firm's only zero coupon debt maturing at T, σ the volatility of the enterprise value, $P_t(T)$ the price at t of a zero coupon bond that pays $1 at T and N(d) the normal cumulative distribution function evaluated at d:

$E_t = V_tN(d_t) - P_t(T)FN(d_t - \sigma*(T-t)^{\wedge(1/2)})$

where $d_t=(Ln(V_t)-Ln(P_t(T)F)/(\sigma*(T-t)^{\wedge(1/2)}) + 0.5\sigma*(T-t)^{\wedge(1/2)})$

and $D_t=V_t-E_t$

This is just an application of the Black and Scholes formula for pricing a European call option. We make the following assumptions for that:

- V, the Enterprise value, follows a log normal distribution with a constant volatility (σ):dV=μPVpdt+ σPVPdz.
- Interest rate r is constant: $Pt(T)=(exp(r*T-t)))^{-1}$
- Trading takes place on a continuous basis.
- Financial markets are perfect.

To get V_t we can do a DCF valuation (in case of distress we could do a liquidation value) of the company. To get σ we could use the weighted average of debt and stock volatility. Once we have V_t and E_t we can back out our market value of D_t.

It is quite obvious that the amount of assumptions to carry out this method makes it very time unrealistic. Therefore, in practice it is barely used and only provides a rough approximation for the value of the equity and hence the value of debt. We will only use it as a marginal approach in our empirical project in section 3.

However, it is worth mentioning that under this approach where we are deriving our market value of debt by subtracting the value of the firm and the equity and in a distress scenario, the equity is worth more than the difference between the firm and the book value of debt. This is due to the fact that the stockholders enjoy the option to default the company and hence the market value of debt is always lower than its book value.

In the next section we go about our WACC analysis and we start breaking down each of the components of the WACC under the CAPM framework, the theoretical cornerstone of our empirical project.

2 Cost of debt (COD)

The cost of debt is the effective rate that the firm pays for holding debt in the balance sheet. Given that the interest bearing debt is tax deductible, the after tax cost of debt is mostly used in the WACC.

There are two ways to calculate the cost the cost of debt:

2.1 Bond approach

This approach is useful for public bond funded companies with little bank debt in their balance sheet. We treat all debt as a coupon bond and we back out the cost of debt (Kd) by using the formula for valuing a bond:

$$V_B = C\left[\frac{1-\frac{1}{(1+k_d)^N}}{k_d}\right]+\frac{FV}{(1+k_d)^N}$$

where

V_b = Value of the bond

C = Coupon

K_d = Cost of debt

FV = Face value at maturity

N = Maturity

Note that the interest expense is tax deductible so our K_d is:

$$After-tax\,k_d = Before-tax\,k_d(1-t)$$

2.2 CAPM style approach

The after tax cost of debt is calculated as follows:

(Risk Free Asset + Debt spread)*(1-T)

This is the CAPM type of cost of equity calculation bringing the return above the RFA (Risk Free Asset) into the cost of debt. We break out the formula to understand each moving par.

2.2.1 Risk Free Asset (RFA)

The Risk Free Asset (RFA) in an investment is what the investors should earn in the long term on a risk free basis. The 10yr Treasury bond of the country where the company operates is the most common RFA given:

- The sovereign likelihood of default is usually low and supposedly lower than that of a corporate[21].
- The 10tr Treasury bond is more liquid than the 30yr T bond and best matches the discounted cash flows analysis in any valuation exercise.
- It is less susceptible to unexpected changes in inflation and the liquidity premium, which may affect more yields on longer term bonds.

If the company operated in the different countries/markets, the RFA should be the weighted average of the 10yr Treasury bonds (in terms of revenues, Ebitda, or assets) of the countries where the company has presence on.

Please note that risk free asset should be consistent with the cash flows, therefore if we discount nominal / real cash flows we should use the nominal / real risk free rate.

2.2.2 Debt Spread

The debt spread is the effective margin above the RFA that a company pays for not being risk free and use debt financing. There are three ways to estimate the debt spread:

- Use the book values in the balance sheet and P&L: divide the cash and non cash interest items in the P&L by the on and off balance sheet debt including securitization, operating leases, etc.
- Use the credit default spread (CDS) of the company that trades in the market[22].
- If the company is not rated, calculate the synthetic rating of the company and assign the spread of the rating.

The first method allows to quickly estimating the current spread that the company pays for its current debt holding. This is the current cost of financing. However, the spread might not properly account for the current credit status of the company as the debt could have been recorded in the balance sheet long[23] before the company's credit health weakened. This is the historical interest cost, the book value cost of the debt financing.

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[21] We emphasize "supposedly" as many sovereigns have defaulted over the last 20 yrs (Argentina, Colombia, etc) undermining the thesis of the risk free nature of the sovereign bonds.

[22] Which effectively shows the price of insuring debt in the event of a default?.

[23] Fixed long term interest bearing debt is not easy to be repriced up if the company's credit health worsens as it was set upon the inception of the debt contract between the lenders and the borrower so lenders sometime enjoy limited power to revise up their loans/bonds spreads if the loan documentation does not provide it for.

The second method gives the current market perception of the credit risk of the company and the price that the company should pay for its debt. It effectively shows the recovery of the debt in the event of a default. It is a market price for insuring the debt of an issuer and therefore accurately reflects the market perception of the financial risk of the issuer. The main constraint here is that some companies do not have CDS trading in the market and there are some other forms of debt (in general secured debt such as covered bonds, commercial paper, etc) which have no CDS[24]. Additionally, the CDS, as a derivative, is driven by technical or macro factors that sometimes stray from the fundamental credit quality of the company. Therefore, to rely on the CDS to estimate the spread means to constantly assess the pricing of a derivative and its components which is in some instances turns out difficult and subjective (Goldman Sachs 2011).

The third method is the fundamentally credit driven approach which allows to constantly gauge the credit health of the company based on its credit metrics and the fair price that the company should pay for taking on debt. It also allows validating or completing the other methods which either lack up to date fair prices, or fail to capture the fundamental credit health of the company.

In our empirical analysis and for comparison purposes we use the first and third methods. The former shows the current market spread at the time of distress or post restructuring[25]. The latter allows to estimating the fair spread that the company should pay on the basis of its credit metrics. We will also refer to the absolute difference between both approaches to account for the market premium/discount embedded in the cost of debt.

2.2.2.1 Synthetic rating method

This method seeks to estimate the credit rating of a company based on several key credit metrics and as a result, assign a fair spread above the RFA for the cost of debt.

The process is as follows:

1. Estimation of the implied rating of the company based on key credit metrics. We use the S&P main credit metrics to assess the credit health of the company. Below, the average credit metric levels for industrial companies over the last 20 years. We use these levels as a reference to estimate the potential credit rating.

Credit Rating	Ebit interest overage	Ebitda interest overage	FFO/total debt	Debt/Ebitda	Return on capital	Total debt/total capital	Free operating cash flow	Free operating cash flow
AAA	23,8	25,05	203,3%	0,4	27,6%	12,4%	127,6%	127,6%
AA	19,5	24,6	79,9%	0,9	27,0%	28,3%	44,5%	44,5%
A	8	10,2	48,0%	1,6	17,5%	37,5%	25,0%	25,0%
BBB	4,7	6,5	35,9%	2,2	13,4%	42,5%	17,3%	17,3%
BB	2,5	3,5	22,4%	3,5	11,3%	53,7%	8,3%	8,3%
B	1,2	1,9	11,5%	5,3	8,7%	75,9%	2,8%	2,8%
CCC	0,4	0,9	5,0%	7,9	3,2%	113,5%	-2,1%	-2,1%

Source: S&P and author

[24] There are usually two types of corporate CDS: senior unsecured CDS and subordinated CDS.

[25] However, it could be different from the fair cost of debt based on the current credit metrics at the time (approach 3) as the interest cost might have not changed for the company for a long time (for example fixed interest loans/bonds).

- Ebit interest coverage: EBIT (Earnings Before Interest and Taxes) divided by the total interest expense . Ebit is adjusted for non recurring items such as extraordinaries and exceptionals and should exclude the operating leases rent which are capitalized (Adjusted Ebit). Interest should include cash, non cash and capitalized operating leases rent.

    - Objective: assess the ability of the company to pay its interest expense through operating income.

- Ebitda interest coverage: EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) dividend by the total interest expense. Ebitda is adjusted for non recurring items such as extraordinaries and exceptionals and should exclude the operating leases rent which are capitalized (Adjusted Ebitda). Interest should include cash, non cash and capitalized operating leases rent.

    - Objective: assess the ability of the company to pay its interest expense through its cash operating income.

- FFO / Debt: FFO (Funds From Operations = net income + taxes + nonrecurring items + depreciation and amortization) divided by total debt. This ratio compares the profitability of the company after interests, taxes and dividends versus its debt. This ratio is a semi cash proxy as it does not include cash items such as capital expenditures and change in working capital so it might turn out misleading or inaccurate if the company is capital intensive business or fast growing. Debt should include all long and short financial debt, capital leases, capitalized operating leases and any other off balance sheet financing minus the cash "cushion" after subtracting the necessary cash for the daily business of the company.

    - Objective: assess the profitability of the company relative to its debt holdings.

- Debt / Adjusted Ebitda: This ratio shows the leverage of the company in terms of its cash operating income.

    - Objective: asses the gearing of the company and its operating income generating capacity to increase/decrease its debt.

- Return on Capital: Adjusted Ebit / (Debt + Equity). This ratio shows the return for the capital suppliers of the company before interest, taxes and dividends.

    - Objective: asses the return rate for the capital contributors of the company.

- Total Debt / Total Capital → Debt / (Debt + equity).

    - Objective: asses the book gearing in relation to the overall capital of the company..

- Free operating cash flows / Total Debt: free operating cash flow (free cash flow before debt service, dividends/ stock buybacks and capital raises but after capex, working capital and other cash inflow/outflow items). Debt Service includes interest and debt repayments.

    - Objective: asses the cash flow generation capacity of the company before the debt and equity service. The aim is twofold: evaluate the capability of the firm to cope with the capital

service through internal money generation or through additional external capital and the pace of deleveraging given its free cash flow generation.

2. Assign a weighted average rating given the key fundamental credit metrics. We assign a weight to the different credit metrics to come up with a blended rating credit for the company.

Ebit interest coverage	12%
Ebitda interest coverage	12%
Return on capital	6%
FFO/debt	40%
Debt/Ebitda	30%

We assign weightings in terms of its relevance. To our mind and in order of preference, FFO / Debt as the cash flow based ratio and Debt / Ebitda as the leverage ratio are the most important ratios. We exclude the Free Operating Cash Flow / Debt ratio due to the lack of reliable data to calculate the ratio.

3. Assign a spread over RFA on the basis of the blended credit metric. We use the 30 yr median spreads from Bloomberg to come up with the spread per rating.

2.2.3 Taxes

We use the marginal tax rate instead of the effective tax rate for comparison purposes. The different between both stems from some temporary or permanent accountancy deductions which can be regular or just one offs and hence difficult to evaluate. If there are some tax losses carried forward we account for them in the tax rate

3 Cost of Equity

The cost of equity is the theoretical return that the firm should pay to its shareholders to obtain capital from them. While the cost of debt for a company is somewhat observable in the market by looking at the yield of a bond for example, the cost of equity is not easily observable and must be estimated. There are two main approaches: the Gordon model and the CAPM.

3.1 Gordon model

It is a version of the popular Gordon / Constant Dividend model. It assumes that the dividend (D) of a company grows at constant pace (g).

$$k_e = \frac{D_0(1+g)}{V_e} + g = \frac{D_1}{V_e} + g$$

where

K_e = Cost of equity

D_o = Dividend day 0

D_1 = Dividend day 1

g = dividend growth rate

V_e = Market value of equity

As the dividends are not tax deductible, there is no tax adjustment needed to determine the cost of equity.

3.2 CAPM

There are several models to estimate the cost of equity. The choice between them hinges on data reliability, model complexity and the treatment of the Equity Risk Premium (ERP).

Below we show the most common models used by Corporate Finance professional and academics to estimate the cost of capital. It is worth noting that they all follow common views about risk and return (Damodaran 2008). First, risk is defined in terms of variance in current returns to the expected return. Second, risk is also assessed in terms of a marginal investor who happens to be a diversified one. [26]

	Model	*Equity Risk Premium*
The CAPM	Expected Return = Riskfree Rate + $\text{Beta}_{\text{Asset}}$ (Equity Risk Premium)	Risk Premium for investing in the market portfolio, which includes all risky assets, relative to the riskless rate.
Arbitrage pricing model (APM)	Expected Return = Riskfree Rate + $\sum_{j=1}^{j=k} \beta_j (\text{Risk Premium}_j)$	Risk Premiums for individual (unspecified) market risk factors.
Multi-Factor Model	Expected Return = Riskfree Rate + $\sum_{j=1}^{j=k} \beta_j (\text{Risk Premium}_j)$	Risk Premiums for individual (specified) market risk factors
Proxy Models	Expected Return = a + b (Proxy 1) + c (Proxy 2) (where the proxies are firm characteristics such as market capitalization, price to book ratios or retuen momentum)	No explicit risk premium computation, but coefficients on proxies reflect risk preferences.

Source: Damodaran (2008)

Third, they all require the same inputs: risk free asset, beta (CAPM or betas in the APM) and the risk premiums for a portfolio of non-riskless assets (CAPM or factor risk premiums for the market risk factors in the APM and the multi-factor models). All these models are commonly used by financial investors and practitioners and all exhibit their own merits and limitations (Fama 1970). For the purpose of our empirical exercise and as we will explain later, we will stick to the CAPM model to carry out our WACC project.

The Capital Asset Pricing Model (CAPM) is often used to estimate a theoretical required rate of return of a particular asset, in this case the equity. The model takes into consideration the sensitivity of the asset to the non-systematic or market risk (non-diversifiable risk) which is represented by the Beta (β), the expected return of the Risk Free Asset (r_f) and the Equity Risk Premium (E_M).

$$k_o = r_f + [E_M - r_f]\ \beta_L$$

[26] This allows for the popular risk breakdown between diversifiable (idisioncratyc) and non diversifiable (systemic) risk.

To use the CAPM formula in practice we need to figure out the Risk Free Asset (RFA), the market portfolio, the expected return (ERP) on the market portfolio and then estimate the beta.

We undertake the same approach as we have done for the CAPM related cost of debt. We break out the formula to walk through the different components of the CAPM

3.2.1 Equity Risk Premium (ERP)

The equity risk premium (ERP) is the return above the risk free asset (RFA) that investors demand for investing in equities. The estimation of the ERP hinges on the risk aversion of the investors and the market risk perception of the equities market.

In the equities world, any perception of the true and fair value of the stock is a manifestation of the prevailing ERP so the ERP cannot be taken for granted or otherwise the estimation of the cost of equity, WACC and ultimately the value of a firm can be seriously distorted.

Under the CAPM and security portfolio theory, how shall we identify the market portfolio?. Again, theory and practice at odds: theory states that we should select the basket of all assets that investors can invest in. Practitioners advocates for a leading equity index such as S&P 500, or FTSE 100 given we only have reliable return data on large stocks to do any analysis and firms themselves own enough of other assets (real estate, gold, oil, etc) to argue that the equity index is really a good proxy for the entire market. This is suitable for companies with a worldwide footprint. If the company only operates in Spain for example, then we would rely on the IBEX 35.

Before examining the different analytical approaches to estimate the ERP, it is worth discussing the determinants of the ERP. Following Damodaran (2008), the main factors are:

1. Risk aversion: investor age and preference for current consumptions are the key variables.
2. Economic risk: the health and predictability (inflation, interest rates etc) of the economy are the major determinants.
3. Information: transparency, accuracy and thoroughness in information tends to lower the ERP.
4. Liquidity: large discounts on equity holdings and transactions costs on holding/trading equity is a key driver of ERPs.
5. Catastrophic risk: event that rarely occurs but could have devastating effects (1929 Great Depression, 2008 Credit Crunch, etc).

3.2.1.1 Estimation of the ERP

Following Damodaran (2005), there are three main methods to estimate the ERP:

1. *Surveys*: consists on surveying multiples investors to ascertain their desired risk premium and calculate the averaged premium. This method has a number of limitations: it is not viable to be able to survey all investors in the market. Furthermore, there are no limits on reasonability as we could find ERP below 0% or as large as 50% and they are very volatile. Ultimately, these surveys are usually very short dated so not very representative of the average ERP of a particular period.

2. *Historical premiums*: this is the premium that has historically been earned above the RFA. Academic and practitioners do not seem to agree on the basics of the historical period; the use of Treasury bill or bond rates; the use of the geometric or arithmetic averages.

This is the most widely used approach to estimate the equity risk premium. Nonetheless, it usually yields different absolute levels as there is no standardized framework for that with numbers ranging from 11% at the upper level to 3% at the lower one. Following Damodaran (2008), there are three reasons for that:

1. Time Period: there is no general agreement about how far in the past the equity risk premium should be estimated upon. Below we can observe the standard errors in Historical ERPs:

Estimation Period	*Standard Error of Risk Premium Estimate*
5 years	$20\%/\sqrt{5} = 8.94\%$
10 years	$20\%/\sqrt{10} = 6.32\%$
25 years	$20\%/\sqrt{25} = 4.00\%$
50 years	$20\%/\sqrt{50} = 2.83\%$
80 years	$20\%/\sqrt{80} = 2.23\%$

Source: Damodaran (2008)

2. Risk Free Security and Market Index: also, there is no general consensus as to whether compare the expected return on equity with treasury bills (short term government bonds) or treasury bonds (long term government bonds)[27].

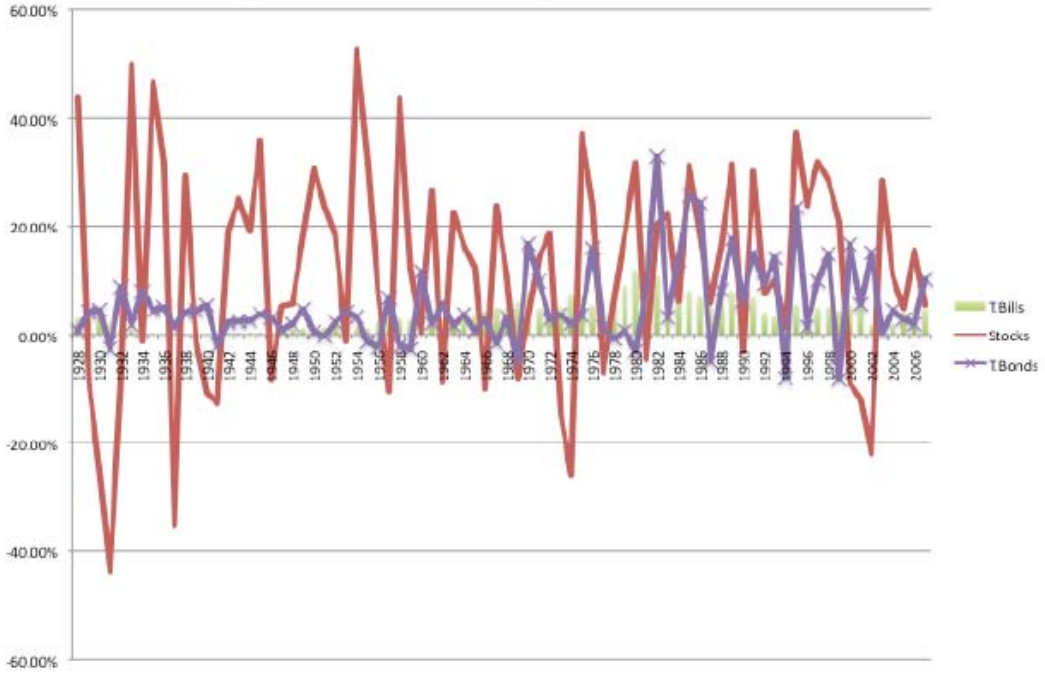
3. Averaging Approach: this refers to whether use the arithmetic or geometric average. This is a very sensitive approach as arithmetic average will deliver higher ERPs than geometric averages[28].

As underscored above, the choice between different time periods, risk free and averaging has a meaningful impact on the ERP. To prove that, we can observe below the return data on US equities, treasury bills and bonds between 1928-2007.

[27] The fact that the yield curve has been upward sloping in US, the range of ERP values would be very large.

[28] Practitioners tend to use the arithmetic average (if annual returns are no correlated through time and the goal would be to estimate the ERP for the following year, it could be best and a less biased estimate) rather than the geometric one. However, there are strong arguments to choose the latter according to Damodaran: empirical research indicates that equity returns are negatively correlated and hence the arithmetic average return will probably overstate the ERP. On top of that, to use arithmetic averages premiums to estimate discount rates which are compounded overtime seems inconsistent.

Figure 3: Annual Returns on Stock, Bonds and Bills- 1928 -2007



Source: Damodaran (2008)

As one can see, returns and volatilities are very different among the three instruments:

	Stocks	*T. Bills*	*T. Bond*
Mean	11.69%	3.91%	5.26%
Standard Error	2.21%	0.34%	0.84%
Median	13.31%	3.68%	3.45%
Standard Deviation	19.80%	3.07%	7.47%
Skewness	-32.13%	102.02%	129.21%
Minimum	-43.84%	0.02%	-8.25%
Maximum	52.56%	15.49%	32.81%
90th percentile	32.60%	7.82%	15.12%
10th percentile	-10.67%	0.33%	-2.10%

Source: Damodaran (2008)

From the table, one can back out the ERP by subtracting the arithmetic average return on equities from the average return on bills (7.78%) or bonds (6.43%). We can also observe the ERPs running different scenarios of time period, risk free and averaging approaches.

	ERP: Stocks minus T.Bills		ERP: Stocks minus T.Bonds	
	Arithmetic	*Geometric*	*Arithmetic*	*Geometric*
1928-2007	7.78%	5.94%	6.42%	4.79%
1967-2007	5.94%	4.75%	4.33%	3.50%
1997-2007	5.26%	3.86%	2.68%	1.51%

Source: Damodaran (2008)

One can quickly note that the premium's range hovers between 1.51% and 7.78% under the different scenarios, supporting the difficulties of correctly estimating the ERP.

If the process of coming up with a reliable US ERP is not an obvious one, it becomes far more intricate when looking at other markets that exhibit more volatility and lack enough long term data. While economies such as Germany, France or Italy are regarded as mature countries, their equity markets have been traditionally different and fairly thin compared to that of US[29].

Dimson, March and Staunton (2006) estimated the ERP for 17 markets between 1900-2005. As it can be observed below the geometric average ERP is 4.04%, 48bps lower than that of US. This emphasizes that using the historical US ERP for other mature markets will result in a higher cost of capital, all things being equal.

	Stocks minus Short term Governments				Stocks minus Long term Governments			
Country	*Geometric Mean*	*Arithmetic Mean*	*Standard Error*	*Standard Deviation*	*Geometric Mean*	*Arithmetic Mean*	*Standard Error*	*Standard Deviation*
Australia	7.08	8.49	1.65	17.00	6.22	7.81	1.83	18.80
Belgium	2.80	4.99	2.24	23.06	2.57	4.37	1.95	20.10
Canada	4.54	5.88	1.62	16.71	4.15	5.67	1.74	17.95
Denmark	2.87	4.51	1.93	19.85	2.07	3.27	1.57	16.18
France	6.79	9.27	2.35	24.19	3.86	6.03	2.16	22.29
Germany*	3.83	9.07	3.28	33.49	5.28	8.35	2.69	27.41
Ireland	4.09	5.98	1.97	20.33	3.62	5.18	1.78	18.37

[29] These markets have been traditionally comprised by few large companies and many private owned firms.

Italy	6.55	10.46	3.12	32.09	4.30	7.68	2.89	29.73
Japan	6.67	9.84	2.70	27.82	5.91	9.98	3.21	33.06
Netherlands	4.55	6.61	2.17	22.36	3.86	5.95	2.10	21.63
Norway	3.07	5.70	2.52	25.90	2.55	5.26	2.66	27.43
South Africa	6.20	8.25	2.15	22.09	5.35	7.03	1.88	19.32
Spain	3.40	5.46	2.08	21.45	2.32	4.21	1.96	20.20
Sweden	5.73	7.98	2.15	22.09	5.21	7.51	2.17	22.34
Switzerland	3.63	5.29	1.82	18.79	1.80	3.28	1.70	17.52
U.K.	4.43	6.14	1.93	19.84	4.06	5.29	1.61	16.60
U.S.	5.51	7.41	1.91	19.64	4.52	6.49	1.96	20.16
World-ex U.S.	4.23	5.93	1.88	19.33	4.10	5.18	1.48	15.19
World	4.74	6.07	1.62	16.65	4.04	5.15	1.45	14.96

Source: Damodaran (2008)

However, we cannot forget the dangers of relying on the past. Even if we take a long historical series, the ERP will command a significant error. Additionally, using the US equity markets as a reference to estimate the ERP for other markets can bias the analysis as it has traditionally been one of the most successful equity markets. Thus, it is necessary to account for the country risk premium when we aim to estimate the ERP outside US.

Following Damodaran (2007), there are two main ways to estimate the Country Equity Risk Premium (CERP) for other countries outside US:

- The CERP is the default spread of the 10 yr sovereign bond (CDS – Credit Default Swap) or the implied default spread based on the sovereign rating for the country.
- The CERP is set on the basis of the volatility of the market versus to the US market following the formula.
    - CERP = Total Equity Risk Premium (TERP) – US Risk Premium (USRP)
        - TERP=USRP*σ Country Equity / σ US Equity
- Country ratings: this method is based on the use of the country rating as a measure of the default risk. The correlation between the credit (default) risk premium and the ERP is very high then it is common that the equity spreads tend to be much higher than those of the credit. Another way to go about it would be to link the bond default spread to the volatility of the bond and stock prices in the market.
    - CERP = Default spread on the country bond * σ Country Equity / σ Country Bond

Now we attempt to estimate the Corporate Equity Risk Premium (CERP2) from the Country Equity Risk Premium (CERP). Following Damodaran, there are three main approaches

- Every firm in the country displays equal exposure to the country risk
    - E (Return) = Riskfree Rate + CERP + β (US Premium)

- The company is equally exposed to the country risk and to the risk of other markets.
    - E (Return) = Riskfree Rate + CERP + Beta (US Premium + CERP)
- The company is differently exposed to country risk [30]
    - E (Return) = Riskfree Rate + β (US Premium) + λ (CERP)

3. *Implied Equity Premiums*[31]: this method assumes that the stocks in a market are well priced and we can easily back out the expected cash flows (stock buybacks and dividends) and hence, by using the internal rate of return, we can estimate the expected rate of return. The main advantage of this approach is that it can be updated as often as one wants as the implied equity premium is a forward looking number.
    - Implied Equity Risk Premium (IERP) = Expected return on stocks – 10yr RFA

In our empirical exercise, we use historical premiums rather than surveys (which we have not conducted) or implied equity risk premiums as this is a back looking forward analysis so the latter will not be very useful within the framework of our market based WACC analysis.

Considering the ERP as a key fundamental and critical parameter in the WACC analysis, we have decided to use a standard 5%[32] (which is the 4% for the average US ERP using different approaches according to Damodaran plus 100bps to account for an extra risk premium under distress) the across US and our mature European markets to avoid more bias and subjectivity in an already controversial exercise[33].

[30] For λ we use a weighting based on revenues, Ebitda, assets, etc.

[31] See Appendix 2 for further details.

[32] Interesting is the risk premium exercise conducted by Welch (2008) that gathers a sample of 400 finance professors. They estimate one year ERP and the thirty year geometric ERP to be about 5% as of 2007. The typical range recommended in their classes is usually 6% (range between 4%-7%). He also shows in his paper that 75% of finance professors stick to the CAPM for WACC purposes; 10% uses the Fame French model and 5% the APT model.

[33] Appendix 3 also shows the currently implied ERP and CRP for the S&P and the main European indices as of November 2011.

Approach Used	*ERP*	*Additional information*
Survey: CFOs	3.80%	Campbell and Harvey survey of CFOs (2008)
Survey: Global Fund Managers	3.80%	Merrill Lynch (July 2008) survey of global managers
Historical - US	4.79%	Geometric average - Stocks over T.Bonds: 1928-2007
Historical – Multiple Equity Markets	4.04%	Average premium across 17 markets: Dimson, Marsh and Staunton (2008)
Current Implied premium	4.54%	From S&P 500 – 9/14/08
Average Implied premium	3.98%	Average of implied equity risk premium: 1960-2007
Implied premium adjusted for T.Bond rate and term structure	3.12%	Using regression of implied premium on T.Bond rate
Default spread based premium	3.80%	Default Spread * (ERP/ Default Spread average)

Source: Damodaran (2008)

Notwithstanding that, we will run sensitivities on our WACC based on different levels of ERP according to Damodaran's findings to evaluate the impact of the ERP absolute level on the WACC.

3.2.1.2 The importance of the ERP

In general, practitioners including investment bankers, corporate finance professionals or strategic consultants tend to use the arithmetic average of historical risk premiums to calculate the cost of equity to derive to the WACC. Notwithstanding that, we should make several caveats to understand the peril of an excessive reliance on the historical ERP.

Generally speaking practitioners use the ERP estimated by well-known services such as Bloomberg or Reuters instead of calculating their own ERP as the collection of raw data and the "cleaning up" process is tough. Additionally, to rely on this ERP allows using the same ERP across the entire organization and thus encouraging consistency in their valuation assessments. However, this approach has disadvantages including our lack of knowledge or understanding about the assumptions and estimates to come up with the historical ERP (Graham 2005).

Secondly, it is necessary to estimate an adequate ERP. There are both costs to being too aggressive or conservative with calculating the ERP and reason why practitioners tend to use an ERP between 4% to 6% for the US and developed countries. A too high ERP will render a high cost of equity and WACC and consequently a low company's valuation (under the DCF approach) which could distort the truthful value of the future cash flows of the company[34].

Thirdly, markets stick to the same ERP year after year for both inertia and for the wrongful assumption that the ERP does not change significantly through the years. However, this is a perilous assumption as

[34] Since the asset's value is the PV of the future cash flows and the ERP mostly affects the cash flow further out in time so a high ERP will render low value on the cash flows of companies with highly potential growth versus companies with more mature assets.

ERP changes given the risk aversion of investors and the ongoing developments in the market (turmoil, wars, etc) so the ERP has to be constantly up to date to avoid inflating or deflating the WACC.

3.2.2 Beta

Beta (β) is the measure of the sensitivity of the asset return to the market return. It measures the systematic or non-diversifiable risk or in general the market risk. Generally speaking, a positive (or negative) asset's beta implies that the returns of the assets follow (move negative to) that of the market return.

The formula for the asset's beta within a portfolio is:

$$\beta_a = \frac{\mathrm{Cov}(r_a, r_p)}{\mathrm{Var}(r_p)},$$

being

r_a = rate of return on the asset

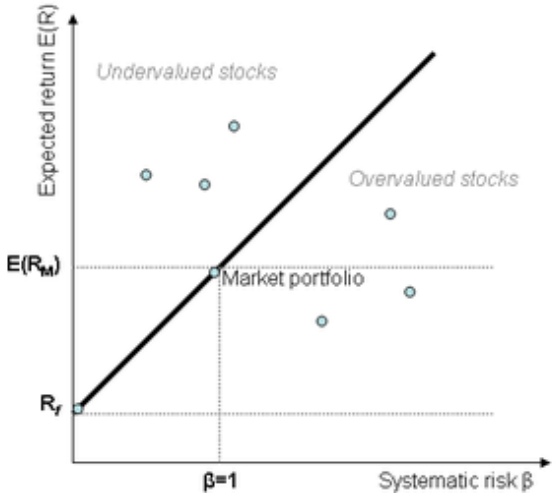
r_p=rate of return of the portfolio

cov(r_a,r_p)= covariance between both rates of returns

Var(r_p)= variance of the portfolio

Below, we can see the relation between the β, r_p ,RFA, and the r_a trough the SML (Security Market Line).This line represents the expected return rate of an asset as a function of the systematic and non-systematic risk (β).

Figure 14: SML Line



Source: Author

Generally speaking, the company has four different betas: the asset beta when the company is debt free, the asset beta when the company is indebted, the equity beta and the debt beta. It is obvious that that the asset beta is the same as the liabilities beta and therefore when the company is debt-free the asset beta is equal to the equity beta. On the other hand, when the company carries debt, the equity beta must match the liability beta. The latter is estimated through the weighted average of the equity and debt betas.

We follow Mascareñas (2007) rationale to estimate our levered equity beta.

In order to get to the equity beta of a indebted company, we start from these two statements:

- According to Modigliani and Miller (MM), the value of a company (V_L) is equal to the values of its assets when the company is debt free plus (V_u) the present value of the tax shield (t_d). Therefore, the value of an indebted company is $V_L=V_u+t_d$.
- On the other hand if we contemplate the company from the liabilities standpoint, its value is equal to the market value of the debt (D) and the equity (E).

If we map both formulas together we can observe that the equity (E) is equal to $E= V_u-D(1-t)$ ie the value of the equity is equal to the value of the debt free company minus the value of the debt plus the PV of the tax shield. As we mentioned above, the asset beta of an indebted company (β_L) is equal to the weighted average of the equity (β_e) and debt betas (β_d):

$$\beta_L = \beta e \frac{E}{E+D} + \beta d \frac{D}{E+D} = \beta e \frac{E}{V_L} + \beta d \frac{D}{V_L}$$

If we use the value of the company by MM we get to another value of the asset beta of an indebted company by assuming that V_L breaks down in two parts with their betas and weightings.

$$V_L = V_u + tD$$

$$\beta_L = \beta u \frac{V_u}{V_u + tD} + \beta d \frac{tD}{V_u + tD} = \beta u \frac{V_u}{V_L} + \beta d \frac{tD}{V_L}$$

If we map both formulas across to each other we can get to the equity beta (β_d):

$$\beta e \frac{E}{V_L} + \beta d \frac{D}{V_L} = \beta u \frac{V_u}{V_L} + \beta d \frac{tD}{V_L} \rightarrow \beta_e E + \beta_d D = \beta_u V_u + \beta_d tD$$

$$\beta_e E = \beta_u V_u - \beta_d D(1-t)$$

$$\beta_e = \beta_u \frac{V_u}{E} - \beta_d \frac{D(1-t)}{E}$$

And, as $E= V_u-D(1-t) \rightarrow V_u= E+D(1-t)$, then,

$$\beta_e = \beta_u \frac{E + D(1-t)}{E} - \beta_d \frac{D(1-t)}{E}$$

$$\boxed{\beta_e = \beta_u \left[1 + \frac{D(1-t)}{E}\right] - \beta_d \frac{D(1-t)}{E} = \beta_u + (\beta_u - \beta_d) \frac{D(1-t)}{E}}$$

,meaning that the systematic risk of the equity is equal to that of the debt free company plus the difference between the systematic risk of the debt free company and the debt times the leverage ratio (D/E) factored in the tax shiel ıligible (β_d=0), then,

$$\beta_e = \beta_u \left[1 + \frac{D(1-t)}{E} \right]$$

On the other hand, the asset beta of an indebted company (β_L) can be expressed in terms of the unlevered beta (β_u).

$$\beta_L = \beta e \frac{E}{E+D} + \beta d \frac{D}{E+D} = \left[\beta_u + (\beta_u - \beta_d)(1-t)\frac{D}{E} \right] \frac{E}{E+D} + \beta d \frac{D}{E+D} =$$
$$= \beta_u \frac{E}{E+D} + (\beta_u - \beta_d)(1-t)\frac{D}{E+D} + \beta_d \frac{D}{E+D} =$$
$$= \beta_u \frac{E}{E+D} + (\beta_u - \beta_d - \beta_u t + \beta_d t + \beta_d)\frac{D}{E+D} =$$
$$= \beta_u \frac{E}{E+D} + \beta_u \frac{D}{E+D} - (\beta_u - \beta_d)\frac{Dt}{E+D} = \beta_u - (\beta_u - \beta_d)\frac{Dt}{E+D}$$

3.2.2.1 Debt Beta

Following Mascareñas (2007), we can use two methods to calculate the cost of capital: the weighted average cost of capital and the CAPM.

The weighted average cost of capital (k_o) is calculated by estimating the average cost of the equity (k_e) and the debt (k_i) after taxes, weighted by value of both financial resources in the capital structure leading us to the popular expression:

$$k_o = k_e \frac{E}{E+D} + k_i (1-t) \frac{D}{E+D}$$

where k_i*(1-t) is the post-tax cost of debt

On the other hand, using CAPM we can calculate the cost of capital by using the following expression:

$$k_o = r_f + [E_M - r_f]\ \beta_L$$

which is a way to estimate the return demanded by the market on the basis of the systematic risk of the company's assets. It is obvious that both formulas are to match each other and to do so,

$$k_e = r_f + [E_M - r_f]\ \beta_e$$
$$k_i\ (1-t) = r_f + [E_M - r_f]\ \beta_d$$

then

$$k_o = k_e \frac{E}{E+D} + k_i (1\text{-}t) \frac{D}{E+D} = [r_f + (E_M - r_f)\,\beta_e] \frac{E}{E+D} + [r_f + (E_M - r_f)\,\beta_d] \frac{D}{E+D} =$$

$$= r_f + (E_M - r_f)\,[\beta_e \frac{E}{E+D} + \beta_d \frac{D}{E-D}] = r_f + (E_M - r_f)\,\beta_L$$

and it can be inferred that,

$$k_i (1\text{-}t) = r_f + [E_M - r_f]\,\beta_d$$

which is a key formula for the following reasons:

- If a company had a cost of debt before taxes equal to the return of the risk free asset , the debt beta would be:

$$r_f (1\text{-}t) = r_f + [E_M - r_f]\,\beta_d \rightarrow -r_f t = [E_M - r_f]\,\beta_d \rightarrow \beta_d = \frac{-r_f\, t}{E_M - r_f}$$

in other words, a company that pays an interest close to the nominal risk free asset will have a negative debt beta[35].

- On the other hand for the debt beta to be null the cost of that before taxes should be equal to

$$k_i (1\text{-}t) = r_f + [E_M - r_f]\,0 \rightarrow k_i = \frac{r_f}{1-t}$$

Through this analytical process, It can be inferred that some companies will have negative debt betas but a positive leverage ratios and, needless to say, a BB o lower rated companies will have positive debt betas and a significant leverage ratio. In both cases, the generic expression and not the simplified version has to be used when calculating the unlevered asset beta.

3.2.2.2 Determinants of the beta

The beta is mostly driven by these three factors:

- The nature of the products or service offered by the company: other things equal, the more discretionary the product or service of the company, the higher the betas as the earnings become more volatile. Therefore, the beta of the:
    - Cyclical businesses > non-cyclical businesses.
    - Luxury goods firms > basic goods firms.

[35] As long as the company is profitable.

- High priced goods firms > low priced goods firms.
- Growth firms > mature firms.

- Operating leverage [36]: other things equal, the higher the fixed costs of the company, the higher the beta. Therefore, the beta of:
  - Rigid costs structure and high capex intensive firms > flexible costs and low capex intensive firms.
  - High growth and young companies > low growth and mature firms.
  - Smaller firms > larger firms.
- Financial leverage: other things equal, the higher the level of indebtness, the higher the equity beta.

3.2.2.3 Estimation of the equity beta

The estimation of the Beta is the one of the most sensitive exercise when calculating the WACC at market prices. There are in general three ways to estimate beta:

- Relying on well-established softwares such as Bloomberg provide daily, weekly, monthly and annually raw and adjusted betas.
- Running a regression on past returns of the asset.
- Estimating the industry betas.

The first approach means to rely on reputable market softwares that provide up to date data on the companies' betas. This is the source that most practitioners use as it allows to quickly gather betas for companies across different time frames. The main shortcoming of this source of data is that we ignore the quality of the data first and second the beta is fairly “raw” and should undergo a “clean up” process by delevering and relevering itself through the industry beta and a the D/E target ratio.

The second approach implies to run a regression on the returns of the asset over the course of a specific period. We lay out the following model:

- r_t is the realized return of a stock over the period t including the dividends.
- r_{mt} is the realized return of a particular market index over period t including dividends.
- r_f is the risk free asset over period t.

and we run the regression using excel or some other softwares.

[36] Fixed costs as a percentage of total costs.

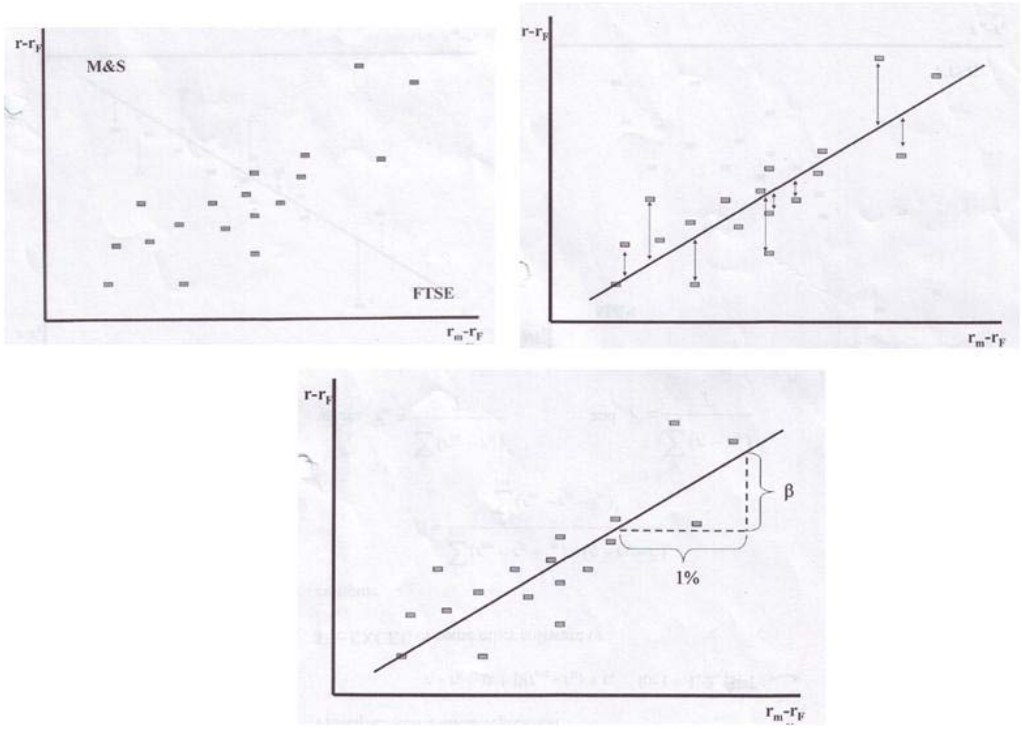
$$\beta = \frac{\sum_{t=1}^{T}(r_{mt} - r_{ft} - \overline{r}_m) \times (r_t - r_{ft} - \overline{r})}{\sum_{t=1}^{T}(r_{mt} - r_{ft} - \overline{r}_m)^2}$$

where

$$\overline{r}_m = \frac{\sum_{t=1}^{T}(r_{mt} - r_{ft})}{T} \qquad \text{and} \quad \overline{r} = \frac{\sum_{t=1}^{T}(r_t - r_{ft})}{T}$$

We estimate the beta following these three steps:

Figure 14: Beta Regression



Source: Author

To estimate the beta we need to choose the period of data, the returns' frequency (daily, monthly, quarterly, etc) and the stock market index. For instance, Banco Popular should use five years of monthly data and the IBEX 35 as 95% of its profits come from its Spanish operations.

To come up with a reasonable regression, we need at least 50 observations; hence if we use monthly data we need at least 4 years. The shorter the period the more likely the beta reflects the current business. The main drawback of daily/weekly data is that it captures microstructures effects from trading and bid ask spreads that distort the beta estimation, which is exacerbated in small/mid cap companies.

This model yields a beta which is considered to be “raw”. Several academic research (Blume 1975) have found that betas above one are likely to be overestimated on average and tend to revert towards one in the future whereas betas below one are more underestimated and prone to move towards one in the future.

Beta services adjust for this by moving their “raw” beta estimates back towards one to give forecasts. The most common adjustment is to shift the estimates around one third of the way back to one[37]

Additionally, if the business of the firm is changing, it is necessary that the beta captures that by using the beta of the business the company is moving in. For instance, when M&S entered the food market, its beta should the weighted average of clothing retailing and food going forward.

Another useful adjustment should be to account for period of turmoil or turbulences to weight certain periods or adjust for one off event (subprime crisis in 2008, crash of 1987, etc). This adjustment should only be made if the analyst thinks this would never occur again.

3.2.2.3.1 Estimation of equity beta using industry averages and asset beta

Generally speaking the beta for individual companies usually displays errors stemming from the need of historical prices and the standard errors embedded in the regression, so the reliance on individual betas to calculate the cost of equity could severely distort the WACC.

The average of the industry betas where the company operates (bottom up beta) usually have much lower errors and this is what we should use if we are not experts at estimating betas. Furthermore, if the company is a non-traded asset (private company, division of a company or conglomerate of a firm) the bottom up beta using the industry average allows a close estimation of the company’s beta.

To estimate the bottom up beta, we begin with the Modigliani and Miller formula:

$r_A = (D/V)*r_D + (E/V)*r_E \rightarrow r_E = r_A + (D/E)*(r_A - r_D)$

Similarly we have,

$\beta_E = \beta_{ASSET} + (D/E)*(\beta_{ASSET} - \beta_D)$

The equity beta of a company captures the fundamental risk of the assets of the firm (asset beta) and also accounts for the risk embedded in the financial leverage of the company. Therefore, we cannot just calculate the equity betas of the firms in the same sector with different capital structures.

Likewise, the asset beta pertains to the assets, and thus it is the beta of the free cash flow coming from the assets.

$\beta_{ASSET} = \beta_{DEBT} * (D/(D+E)) + (E/((D+E))*\beta_{EQUITY}$

There is an important remark to be made. We are assuming that the leverage ratio of the firm is constant, and then the risk of the tax shield should be equal to the risk of the asset. Thus,

$\beta_{ASSET} = \beta_{TAX\ SHIELD}$

[37] This is what Bloomberg for instance does – Adjusted Beta = 0.67*Raw Beta + (0.33)*1.

The asset beta of a company is the weighted average of the betas of the equity and debt. We rely on the cost of debt and equity to estimate the asset beta because they are observable but the asset beta holds the risk of the firm's assets[38] and hence, it should not be affected by the capital structure of the firm but by the cash flows generated by the these assets. The asset beta is what can be calculated through an average of the similar assets across firms in the same industry.

Thus, we can compare and average asset betas of firms in the same sector. The process is as follows:

1. We first compute the asset betas of the comparable companies (peers). To do so, we delever the equity betas of the firm (A).

   $\beta_{ASSET} = \beta_{DEBT} * (D/(D+E)) + (E/((D+E))*\beta_{EQUITY} \rightarrow$ = A Debt spread / $(R_M - R_F)$

2. We compute the average industry asset beta weighted by either market cap or enterprise value.

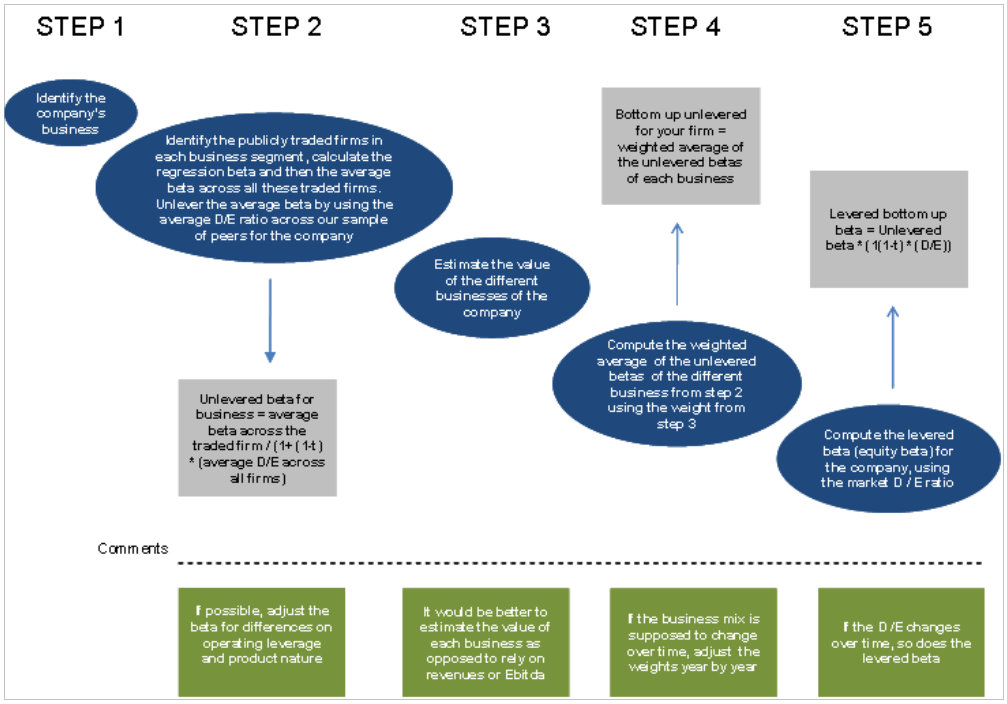
3. We derive our equity beta by relevering the industry beta using a D/E target.

   $\beta_{EQUITY} = \beta_{INDUSTRY} + (D/E) * (\beta_{\beta INDUSTRY} - \beta_{DEBT})$

This is the equity beta that we use to determine our cost of equity under CAPM

See below a summary of the different steps to calculate the equity beta.

Figure 14: Equity Beta Estimation



Source: author

[38] Modigliani and Miller (1963).

4. Cost of preferred equity

We calculate the cost of preferred equity by dividing the preferred dividends by the market value of the preferred stock.

$$k_P = \frac{D}{V_P}$$

where

K_p = Cost of preferred equity

D = Preferred dividend

V_p = Market value of preferred equity

It must be noted that the preferred dividends are not tax deductible so no adjustment is needed to calculate the cost of preferred equity.

5 Flotation costs

Companies in general but distress companies in particular are active in selling securities and they hire investment bankers or consultancies to undertake this job for them. The advisors provide several services including the setting of the issue price, or the sale to the public to name a few[39]. These services are known as flotation costs and must be included in the WACC.

These flotation costs can be accounted for by reducing the proceeds from the issuance by the flotation costs (Fc) and then calculate again the cost of capital

Cost of debt with flotation costs

$$(V_B - Fc) = C\left[\frac{1 - 1/(1+k_d)^N}{k_d}\right] + \frac{FV}{(1+k_d)^N}$$

Cost of equity with flotation costs

$$ke = \frac{D_0(1+g)}{(V_e - Fc)} + g = \frac{D_1}{(Ve - Fc)} + g$$

39 These services are even more common in distressed companies as the company seeks to refinance its debt or restructure its capital structure by hiring investment bank or consultancies with expertise in corporate restructuring.

Cost of preferred equity with flotation costs

$$k_P = \frac{D}{(V_P - F)}$$

6 Cost of retained earnings

This is often an overlooked item within the traditional cost of capital framework. The firm might use the retained earnings, its own internal funds, to invest in new projects. These funds are not cost free as they belong to the common stockholders. There is an opportunity cost of using these funds for organic purposes instead of paying them out as dividends to the shareholders. Therefore, the cost of retained earnings is equivalent to the cost of new common equity without any flotation cost at all.

$$k_{RE} = \frac{D_0(1+g)}{V_e} + g = \frac{D_1}{V_e} + g$$

SECTION 3

In this section we undertake our empirical analysis on the distressed WACC for both an American and European sample. Section 1 and 2 are the fundamental underpinnings of our analytical exercise. This empirical exercise attempts to ascertain to what extent the WACC for distressed companies captures the efficiency of the restructuring proceeding one year ex and post the restructuring date.

Our initial premise is that the WACC should account for the efficiency of the corporate restructuring mechanism as the WACC in distressed is not only driven by the cost and the expected recovery of the financing sources (effectively their market value) but also by the efficiency of the restructuring framework which seeks to rehabilitate the company as a going concern.

Efficiency means the probability of rehabilitation under a restructuring proceeding to allow the company to emerge as a going concern and return to its ordinary business. As we highlighted in section 1, the value of a company is[40] always higher as a going concern (restructuring) than as a gone concern (liquidation), reason why we advocate that, the WACC of any company facing a corporate restructuring that seeks its rehabilitation should capture that feature as opposed to more creditor friendly jurisdictions that seek to protect the interests of the creditors. Thus, the efficiency represents the likelihood of a well-rounded restructuring, the rate of success in terms of company's rehabilitation and the recovery rate for the investors as a whole. If a restructuring proceeding is efficient enough to ensure a reasonable rate of success[41] for a company to emerge out of the process, the WACC of the company should be able to capture this efficiency. This efficiency should be picked up by the WACC on a pre and post restructuring basis:

- *Pre restructuring efficiency*: as the company enters a distressed stage and heads towards a corporate event (either a liquidation or a restructuring), the WACC should contemplate the likelihood of either of these two event happening. Additionally, it should also measure the soundness and thoroughness of the restructuring proceeding in boosting the value of the company as a going concern or otherwise the residual value of the company in the event of liquidation. Regardless of either corporate event, the WACC should also reflect the expected recovery for investors (debt and equity)[42].

- *Post restructuring efficiency*: this efficiency is only applicable to newly restructured companies. If the company has undergone a successfully restructuring to prop up the capital structure and emerge as a going concern with a high likelihood of meeting with success in the future, the WACC should capture that efficiency. Here the WACC represents the rate of success of a

[40] We consider all investors, senior and junior, as a whole. The former usually receive the same proceeds under both liquidation and restructuring if the asset collateral is significant. However, junior's recovery rate, under a winding up scenario, is usually low or even null.

[41] Rate of success meaning here that the restructuring leads to a corporate rehabilitation rather than to a liquidation.

[42] We must bear in mind that we should look at the WACC as a whole and not at the value of the individual components (cost of equity, cost of debt and capital structure weightings). The recovery rate for investors overall should always be higher as a going concern than as a gone concern as explained in section 1. Therefore, a restructuring proceeding that aims to protect the company and enhances its value should boost the recovery rate for the whole investor base as opposed to some other more creditor friendly jurisdictions that aim to protect the interests of the creditors in general and the senior in particular jeopardizing the recovery rate of other sub-investors.

restructuring with powerful and effective tools to grapple with the distress situation versus to a less structured or old fashioned proceeding which lacks the appropriate instruments to manage the company through the restructuring procedure.

Note that the WACC is not only about debt but also about the equity. In many creditor friendly jurisdictions senior lenders are usually looked after at the expense of junior debt and equity holders. The lower cost of debt of the senior lenders whom enjoy the legal protection are fully offset by the higher cost of debt of the junior, let alone the cost of the equity, whose recovery rate is pretty much null. What we call efficiency in a restructuring is a legal framework that tends to purposely rehabilitate the company as a going concern and fairly manage the interests of the entire investor base.

1 The empirical project

1.1 Sample and the data collection

Our sample includes public companies that came under distress, entered a restructuring process, emerged as going concern and were listed back again between 2000-2009 included. We only focus our analysis on publicly trading firms around the pre and post restructuring dates. The reasons are:

- We undertake our analysis on a market based WACC approach so we need market data for our inputs.
- We need financial statements pre and post-bankruptcy and this is only accessible for public companies with either debt or equity trading in the primary or secondary markets.

Therefore we discard three types of companies: private or non-trading companies; publicly trading companies that were liquidated through the restructuring procedure; publicly trading companies that were privatized through the restructuring process. Thus, our initial sample of thousands of distressed companies that went through restructuring or liquidation through this period, narrows down to a small sample of 30-50 companies.

To gather our sample we use Bloomberg and Thompson 1 database to screen all the public companies that filed for a restructuring through the period. Our second step is to filter the sample by removing all companies that were either private (not traded), were liquidated or privatized after the restructuring. This process leads us to our sample of publicly trading companies.

We also use these two softwares to collect data on: risk free assets, raw betas, market capitalizations, trading levels for currently distressed market debt and some financial data of companies when the financial statements were not available. For fundamental company data we use the financial statements of the companies to gather key metrics such as Ebit, Ebitda, interest expense, debt, equity to name a few and to calculate the main credit ratios such as FFO/Debt, Debt/Ebitda, Ebitda/interests among others. See section 2 for more information.

1.2 Main assumptions

We set three dates for our WACC analysis: the filing date ($WACC_{FY}$), one year before ($WACC_{FY-1}$) and one year after ($WACC_{FY1}$) the restructuring date to evaluate the absolute and relative levels of the cost of capital. One year of difference up and down the filing date enables the WACC to capture the likelihood of

a restructuring or liquidation ($WACC_{FY-1}$) or the efficiency and success of the restructuring if the company emerges from it ($WACC_{FY1}$).

In theory we would expect either $WACC_{FY-1}$ or $WACC_{FY}$ to reach the highest level at the point of maximum distress and $WACC_{FY1}$ to display the lowest level as the company exits the restructuring procedure with a sounder capital structure.

For the cost of equity we use the following assumptions:

- Risk Free Asset (RFA): we use the 10 Yr Treasury bond at each point in time.
- Beta: we use the Adjusted Beta after adjusting the raw beta as explained in section 2[43].
- Equity Risk Premium (ERP): we use the standard 5%[44].
- Country Risk Premium (CRP): for the European companies, we use the 5 yr CDS at the time on top of the RFA to account for the additional risk of investing outside US.

1.3 Fundamental review of the samples

Before digging into the WACC analysis, it is convenient to run through the fundamentals of the companies on an absolute and relative basis across the three periods. This will allow us to observe the improvement and deterioration of the financial, operating and credit metrics of the firms through the period to better understand the outcome of the WACC analysis. Note that the WACC is a blend of fundamental and technical features. The former is driven by the absolute performance of the company. The latter is driven by the market perception of the quality of the asset, the outlook of the company and its sector and the macro environment[45] (fundamentals and technicals are usually at odds).

Please note that in the analysis below we are calculating averages for our samples so be aware of the impact that big companies can exert in the final output. We will see later on the dispersion and skewness of the WACC output due to the size and the distress levels of the companies given the disparity in industries, leverage periods, etc.

As far as the European sample is concerned, we can observe a firm improvement in the operating (Ebitda, Ebit and FFO improving by 2x), and the financial (gross debt down by 18% and equity up by 440%) metrics between FY and FY1[46]. Also, credit metrics strongly improve between both periods with a leverage ratio down to 2.7x and a FFO ratio up to -1.1x from very negative level a year before. Interest coverage ratios also make headway from previous levels.

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[43] We have not calculated the relevered industry beta for two reasons: we want to evaluate the market perceived beta at each point in time; it was difficult to gather reliable data of the group of closest comparable companies.

[44] We will run a sensitivity analysis on ERP to evaluate the WACC levels as the ERP is one of the main drivers of the WACC.

[45] We have witnessed over 2010 for example, the impact that a sovereign crisis has on equities and bonds with a massive sell-off during a sustained period of time regardless of the fundamental performance of the company. A market based WACC usually reflects this macro risk.

[46] Reasons are multiples: higher sales coupled with a cost-cutting program at both the gross margin and SG&A level boosting the positive effect of the operating leverage which is common in many the industries of our sample.

	FY-1	FY	FY1
EUROPE			
P&L			
Ebitda	131	(172)	237
Ebit	(456)	(663)	(242)
Interest	472	538	326
Net Income	(2,738)	(1,410)	(383)
FFO	(2,151)	(918)	96
Balance sheet			
Net Debt	14,668	16,456	13,639
Cash	3,636	2,116	1,409
Gross Debt	18,304	18,572	15,048
Equity	2,377	(950)	3,253
Tangible Assets	19,235	18,903	17,430
Credit Metrics			
D/E	770%	(1,955%)	463%
FFO/Debt	(2.1x)	(6.3x)	(1.1x)
Debt/Ebitda	0.2x	(19.5x)	2.7x
Ebitda/interest	(95.0x)	(14.7x)	25.0x
Ebit/interest	(121.6x)	(25.5x)	(3.5x)

Source: author

As for the American sample, we also observe a strong improvement in fundamentals outpacing the performance of their European counterparts. This is due to the idiosyncrasy of the Chapter 11 (which aims not only to fix the capital structure but also to impose a better income/cost rationalization to ensure the future viability of the company[47]). Operating metrics improve mostly at the Ebit level with a 185% jump in FY1 vs FY. Gross debt is reduced by 38% and equity is replenished by 95% to shore up the capital structure. Consequently, credit metrics are reinforced with the D/E ratio falling from 658% to 209%, FFO ratio almost breakeven form a very negative number and leverage ratio markedly improving between FY and FY1.

[47] Tools such as the stay on creditors, super senior financing or management in place provide for a quick recovery.

	FY-1	FY	FY1
US			
P&L			
Ebitda	6,106	4,710	5,389
Ebit	2,180	724	2,064
Interest	1,410	2,011	1,905
Net Income	1,263	(1,584)	(3,472)
FFO	5,189	2,402	(147)
Balance sheet			
Net Debt	63,397	71,194	26,833
Cash	21,217	25,904	33,441
Gross Debt	84,614	97,098	60,274
Equity	32,420	14,745	28,801
Tangible Assets	215,506	145,222	155,986
Credit Metrics			
D/E	261%	658%	209%
FFO/Debt	(4.6x)	(1.9x)	(0.1x)
Debt/Ebitda	2.1x	(20.1x)	0.0x
Ebitda/interest	(193.7x)	(34.7x)	(0.6x)
Ebit/interest	(196.5x)	(39.1x)	(7.8x)

Source: author

In summary, the improvement in fundamentals between FY-1 and FY1 is, needless to say, a key driver of the absolute and relative value of the WACC between our two samples.

2 The European sample: WACC analysis

We have a thin sample of 26 companies down from more than 5,000 companies that experienced some sort of corporate distressed event since 2000. The sample is small but should not come as a surprise given the bank presence in the corporate capital structure and the absence of a subordinate bond market in Europe[48]. European Banks have traditionally been the main financing providers of the European corporates and been granted with significant collateral (real estate, mortgages, etc) meaning that their loans are usually well covered with a high recovery rate in the event of a liquidation. This preferential status has discouraged banks from accepting any restructuring of the company as a going concern that might jeopardize their preferential interests versus the junior lenders or equity holders. Moreover, banks are reluctant to transfer some value to junior lenders through a restructuring even if their recovery is at par.[49] This feature has prompted many liquidations or otherwise restructurings on the private side taking these companies through a mix of breakups, spinoffs or carveouts (Gilson 2000).

Our sample of companies includes a blend of major legal jurisdictions laid out in section 1 including France, Germany and Spain but others such as Italy, UK and Ireland mostly missing in our sample. This

[48] As opposed to US with a very prolific bond market

[49] For instance a new cash in form of equity or debt is required for an investment of a distressed company. The firm, the equity and the debt come to an agreement provided that the NPV of the investment is sufficiently large. If there is no agreement the result is likely to be under-investment (forego positive NPV investment) but could be over-investment (invest in negative NPV project). Where the result is under investment it is called the “debt overhang problem”. This is an interaction between restructuring and investments. It may be difficult to restructure public debt due to free riders or holdout problems but lack of coordination among public debt holders can be exploited by the bank lender. In general lenders especially senior are reluctant to transfer value to other more junior lenders or equity if their money is already secured on the assets. See Myers, 1977.

does not strike us very much either given the creditor friendly oriented profile of their legal proceedings and the presence of banking debt in the capital structure which saw many publicly distressed companies being wound up or otherwise privatized. Germany, and to a lesser extent France and Netherlands (which we have not described in section 1) are the bigger contributors to our sample owing to their more debtor friendly profile (but still very creditor friendly relative to Chapter 11) which seek company rehabilitation and company value enhancement. Therefore, our sample shows Finish or Austrian companies filing in Germany given the most favorable legal framework for corporate restructurings.

The table below shows the sample of companies in our European universe, the country of residence, the country of filing, and the WACC dates.

					WACC dates		
Name	Sector	Country	Country of Filing	Filing Date	FY-1	FY	FY1
MICROLOGICA AG	Software	Germany	Germany	05/03/2001	31/03/2000	05/03/2001	31/03/2002
PERFECT HOLDING SA	Commercial Services	Switzerland	Switzerland	14/08/2001	31/08/2000	14/08/2001	31/08/2002
SAUNALAHTI GROUP OYJ	Internet	Finland	Germany	13/12/2001	31/12/2000	13/12/2001	31/12/2002
ALVERN NORWAY ASA	Advertising	Norway	UK	21/12/2001	31/12/2000	21/12/2001	31/12/2002
COMPLETEL	Telecommunications	France	France	29/05/2002	31/05/2001	29/05/2002	31/05/2003
TELE2 NETHERLANDS HOLDING NV	Telecommunications	Netherlands	Netherlands	19/06/2002	30/06/2001	19/06/2002	30/06/2003
SER SYSTEMS AG	Software	Germany	Germany	04/07/2002	31/07/2001	04/07/2002	31/07/2003
JAZZTEL PLC	Telecommunications	Spain	Spain	24/09/2002	30/09/2001	24/09/2002	30/09/2003
WWL INTERNET AG	Internet	Germany	Germany	21/10/2002	31/10/2001	21/10/2002	31/10/2003
BAEURER AG	Software	Germany	Germany	23/10/2002	31/10/2001	23/10/2002	31/10/2003
ASPIRO AB	Internet	Netherlands	Germany	18/11/2002	30/11/2001	18/11/2002	30/11/2003
LIBERTY GLOBAL EUROPE-A	Telecommunications	Netherlands	Netherlands	03/12/2002	31/12/2001	03/12/2002	31/12/2003
JOMED NV	Healthcare-Products	Germany	Germany	23/01/2003	31/01/2002	23/01/2003	31/01/2004
AGIPLAN TECHNOSOFT AG	Software	Germany	Germany	03/04/2003	30/04/2002	03/04/2003	30/04/2004
GEOSENTRIC OYJ	Telecommunications	Finland	Finland	24/04/2003	30/04/2002	24/04/2003	30/04/2004
GARANT SCHUH & MODE AG-VORZU	Distribution/Wholesale	Germany	Germany	06/09/2004	30/09/2003	06/09/2004	30/09/2005
PGAM ADVANCED TECHNOLOGIES	Commercial Services	Germany	Germany	11/04/2005	30/04/2004	11/04/2005	30/04/2006
NOVEMBER AG	Pharmaceuticals	Germany	Germany	26/09/2006	30/09/2005	26/09/2006	30/09/2007
WCM BETEILIGUNGS & GRUND AG	Machinery-Diversified	Germany	Germany	08/11/2006	30/11/2005	08/11/2006	30/11/2007
SCANMINING AB	Mining	Sweden	Sweden	06/12/2007	31/12/2006	06/12/2007	31/12/2008
INKU AG	Housewares	Austria	Germany	02/12/2008	31/12/2007	02/12/2008	31/12/2009
EAG-BETEILIGUNGS AG	Textiles	Austria	Germany	19/12/2008	31/12/2007	19/12/2008	31/12/2009
KAMPA AG	Home Builders	Germany	Germany	11/03/2009	31/03/2008	11/03/2009	31/03/2010
ORCO PROPERTY GROUP	Real Estate	France	France	25/03/2009	31/03/2008	25/03/2009	31/03/2010
ARCANDOR AG	Retail	Germany	Germany	09/06/2009	30/06/2008	09/06/2009	30/06/2010
EDOB ABWICKLUNGS AG	Apparel	Germany	Germany	13/08/2009	31/08/2008	13/08/2009	31/08/2010

Source: author

In the next sections we run through our cost of capital analysis by breaking down its main components that lead to our final output: the WACC

2.1 Cost of equity

We use the CAPM approach to estimate the cost of equity (COE).

	COST OF EQUITY (COE)														
	RFA			Adjusted Beta			ERP			CRP (5 yr CDS in bps)			COE		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
MICROLOGICA AG	5.2%	4.8%	5.3%	0.26	0.67	0.88	5%	5%	5%	-	-	-	6.5%	8.1%	9.7%
PERFECT HOLDING SA	3.9%	3.2%	3.0%	1.11	1.25	1.23	5%	5%	5%	-	-	-	9.4%	9.5%	9.2%
SAUNALAHTI GROUP OYJ	5.1%	5.0%	4.3%	0.89	1.36	0.09	5%	5%	5%	-	-	-	9.5%	11.8%	4.7%
ALVERN NORWAY ASA	6.0%	6.2%	5.8%	0.48	2.10	1.85	5%	5%	5%	-	-	-	8.4%	16.7%	15.0%
COMPLETEL	5.3%	5.3%	3.8%	1.35	1.85	1.68	5%	5%	5%	-	-	-	12.1%	14.5%	12.2%
TELE2 NETHERLANDS HOLDING NV	5.3%	5.3%	3.8%	1.87	2.10	0.28	5%	5%	5%	-	-	-	14.7%	15.8%	5.2%
SER SYSTEMS AG	4.9%	5.0%	4.2%	2.15	2.30	0.60	5%	5%	5%	-	-	-	15.6%	16.5%	7.2%
JAZZTEL PLC	5.1%	4.5%	4.0%	1.31	1.68	0.32	5%	5%	5%	-	-	-	11.6%	12.9%	5.6%
WWL INTERNET AG	4.4%	4.6%	4.3%	0.88	1.95	0.46	5%	5%	5%	-	-	4 bps	8.8%	14.4%	6.6%
BAEURER AG	4.4%	4.6%	4.3%	0.77	0.44	0.85	5%	5%	5%	-	-	4 bps	8.3%	6.8%	8.6%
ASPIRO AB	5.0%	5.0%	5.0%	2.89	3.20	0.91	5%	5%	5%	-	-	-	19.5%	21.0%	9.6%
LIBERTY GLOBAL EUROPE-A	5.3%	5.3%	3.8%	2.77	3.35	1.85	5%	5%	5%	-	-	-	19.2%	22.0%	13.0%
JOMED NV	5.3%	5.3%	3.8%	1.85	2.07	1.44	5%	5%	5%	-	-	-	14.6%	15.6%	11.0%
AGIPLAN TECHNOSOFT AG	5.1%	4.2%	4.2%	0.05	1.75	1.58	5%	5%	5%	-	10 bps	5 bps	5.4%	13.1%	12.2%
GEOSENTRIC OYJ	5.3%	4.2%	4.3%	0.55	1.50	0.53	5%	5%	5%	-	-	-	8.0%	11.7%	7.0%
GARANT SCHUH & MODE AG-VORZU	4.0%	4.1%	3.1%	0.14	0.74	0.45	5%	5%	5%	5 bps	4 bps	4 bps	4.7%	7.9%	5.4%
PGAM ADVANCED TECHNOLOGIES	4.2%	3.6%	4.0%	1.21	2.80	1.95	5%	5%	5%	5 bps	4 bps	7 bps	10.3%	17.7%	13.8%
NOVEMBER AG	3.1%	3.7%	4.3%	0.65	0.97	0.61	5%	5%	5%	4 bps	3 bps	5 bps	6.4%	8.5%	7.4%
WCM BETEILIGUNGS & GRUND AG	3.5%	3.8%	4.1%	0.92	1.65	0.95	5%	5%	5%	4 bps	4 bps	5 bps	8.1%	12.1%	8.9%
SCANMINING AB	5.0%	5.0%	5.0%	0.32	1.86	7.75	5%	5%	5%	4 bps	3 bps	74 bps	6.6%	14.4%	49.5%
INKU AG	4.4%	3.7%	3.7%	0.66	1.47	1.25	5%	5%	5%	5 bps	140 bps	83 bps	7.8%	13.1%	11.0%
EAG-BETEILIGUNGS AG	4.4%	3.7%	3.7%	0.60	1.65	0.70	5%	5%	5%	5 bps	134 bps	83 bps	7.5%	14.2%	7.8%
KAMPA AG	3.9%	3.1%	3.1%	0.23	0.56	0.74	5%	5%	5%	10 bps	87 bps	32 bps	5.1%	6.4%	7.0%
ORCO PROPERTY GROUP	3.9%	3.1%	3.1%	1.10	2.03	1.14	5%	5%	5%	10 bps	87 bps	32 bps	9.5%	15.0%	9.1%
ARCANDOR AG	4.6%	3.6%	2.6%	1.41	2.21	1.10	5%	5%	5%	9 bps	35 bps	45 bps	11.8%	15.5%	8.6%
EDOB ABWICKLUNGS AG	4.2%	3.4%	2.1%	1.11	0.41	0.90	5%	5%	5%	12 bps	25 bps	44 bps	9.9%	5.6%	7.0%
Average	**4.6%**	**4.3%**	**4.0%**	**1.06**	**1.69**	**1.23**	**5.0%**	**5.0%**	**5.0%**				**10.0%**	**13.1%**	**10.5%**

Source: author

Our COE comes in at 10.0% for the COE_{FY-1}, 13.1% for the COE_{FY} , and 10.5% for the COE_{FY1} .As expected, the COE at the filing day reaches its highest levels. However, our COE_{FY1} comes in higher than the COE_{FY-1} implying a higher return demanded by investors by holding equity in the newly restructured company. We will seek to interpret these results in our conclusions. As explained in section 2, we assume a 5% ERP as a default premium, but we will run different ERP scenarios to assess the impact on the COE and the WACC.

2.2 Cost of debt

We go about the cost of debt (COD) calculation by using Approach 1 and 3 described in section 2. By doing so we aim to compare the current cost of debt at the moment (what the company is effectively paying) based on its P&L and balance sheet static numbers versus its implied cost of debt based on its synthetic rating which is driven by its credit quality. For both approaches, we use the CAPM methodology.

2.2.1 Cost of debt under Approach 1 (P&L COD)

	COST OF DEBT										
	RFA			Spread			COD			Tax Rate	Pc
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1		FY-1
MICROLOGICA AG	5.2%	4.8%	5.3%	0.6%	0.6%	24.7%	6%	5%	30%	30%	4.1%
PERFECT HOLDING SA	3.9%	3.2%	3.0%	16.0%	16.0%	16.0%	20%	19%	19%	20%	15.9%
SAUNALAHTI GROUP OYJ	5.1%	5.0%	4.3%	16.0%	33.3%	16.0%	21%	38%	20%	26%	15.6%
ALVERN NORWAY ASA	6.0%	6.2%	5.8%	0.7%	0.9%	1.1%	7%	7%	7%	28%	4.8%
COMPLETEL	5.3%	5.3%	3.8%	14.2%	12.8%	7.4%	20%	18%	11%	23%	15.1%
TELE2 NETHERLANDS HOLDING NV	5.3%	5.3%	3.8%	10.5%	10.8%	8.5%	16%	16%	12%	23%	12.2%
SER SYSTEMS AG	4.9%	5.0%	4.2%	16.0%	16.0%	16.0%	21%	21%	20%	30%	14.7%
JAZZTEL PLC	5.1%	4.5%	4.0%	9.4%	13.3%	10.0%	14%	18%	14%	28%	10.5%
WWL INTERNET AG	4.4%	4.6%	4.3%	5.3%	8.1%	8.1%	10%	13%	12%	30%	6.8%
BAEURER AG	4.4%	4.6%	4.3%	9.7%	2.1%	2.1%	14%	7%	6%	30%	9.9%
ASPIRO AB	5.0%	5.0%	5.0%	16.7%	34.5%	15.4%	22%	40%	20%	28%	15.7%
LIBERTY GLOBAL EUROPE-A	5.3%	5.3%	3.8%	9.5%	9.6%	3.9%	15%	15%	8%	23%	11.5%
JOMED NV	5.3%	5.3%	3.8%	6.3%	5.4%	6.8%	12%	11%	11%	23%	9.0%
AGIPLAN TECHNOSOFT AG	5.1%	4.2%	4.2%	4.0%	7.1%	7.1%	9%	11%	11%	30%	6.4%
GEOSENTRIC OYJ	5.3%	4.2%	4.3%	16.0%	27.6%	16.0%	21%	32%	20%	26%	15.7%
GARANT SCHUH & MODE AG-VORZU	4.0%	4.1%	3.1%	7.1%	4.1%	4.1%	11%	8%	7%	30%	7.8%
PGAM ADVANCED TECHNOLOGIES	4.2%	3.6%	4.0%	16.0%	16.0%	16.0%	20%	20%	20%	30%	14.2%
NOVEMBER AG	3.1%	3.7%	4.3%	16.0%	16.0%	21.7%	19%	20%	26%	30%	13.4%
WCM BETEILIGUNGS & GRUND AG	3.5%	3.8%	4.1%	34.5%	38.2%	31.4%	38%	42%	36%	30%	26.6%
SCANMINING AB	5.0%	5.0%	5.0%	16.0%	22.6%	16.0%	21%	28%	21%	28%	15.1%
INKU AG	4.4%	3.7%	3.7%	22.3%	20.7%	20.7%	27%	24%	24%	25%	20.1%
EAG-BETEILIGUNGS AG	4.4%	3.7%	3.7%	18.1%	32.6%	49.4%	23%	36%	53%	25%	16.9%
KAMPA AG	3.9%	3.1%	3.1%	23.4%	6.5%	8.3%	27%	10%	11%	30%	19.2%
ORCO PROPERTY GROUP	3.9%	3.1%	3.1%	5.4%	3.4%	6.4%	9%	7%	10%	30%	6.6%
ARCANDOR AG	4.6%	3.6%	2.6%	10.9%	15.0%	15.0%	15%	19%	18%	30%	10.9%
EDOB ABWICKLUNGS AG	4.2%	3.4%	2.1%	20.0%	36.9%	36.9%	24%	40%	39%	30%	17.0%
Average	**4.6%**	**4.3%**	**4.0%**	**13.1%**	**15.8%**	**14.8%**	**17.7%**	**20.1%**	**18.8%**		**12.9%**

Source: author

Our COD_{FY-1} comes in at 12.9%, 14.7% for the COE_{FY} , and 13.6% for the COE_{FY1} .As expected, the COD at the filing day reaches its highest levels given the burdensome leverage and the rapid deterioration of the credit quality of the companies. It strikes us also the levels of the COE_{FY1} after restructuring. Despite the lower leverage ratio after a liability management which effectively brought gross indebteness down by 18%, the interest cost is still high implying the investor demand for its holding of a risky asset.

2.2.2 Cost of debt under Approach 2 (Synthetic COD)

	COST OF DEBT (based on synthetic rating)												
	RFA			Spread			COD			Tax Rate	Pre Tax COD		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1		FY-1	FY	FY1
MICROLOGICA AG	5.2%	4.8%	5.3%	16.0%	16.0%	16.0%	21.2%	20.8%	21.3%	30%	14.9%	14.6%	14.9%
PERFECT HOLDING SA	3.9%	3.2%	3.0%	16.0%	16.0%	9.0%	19.9%	19.2%	12.0%	20%	15.9%	15.4%	9.6%
SAUNALAHTI GROUP OYJ	5.1%	5.0%	4.3%	16.0%	16.0%	16.0%	21.1%	21.0%	20.3%	26%	15.6%	15.5%	15.0%
ALVERN NORWAY ASA	6.0%	6.2%	5.8%	16.0%	16.0%	9.0%	22.0%	22.2%	14.8%	28%	15.8%	16.0%	10.7%
COMPLETEL	5.3%	5.3%	3.8%	16.0%	16.0%	16.0%	21.3%	21.3%	19.8%	23%	16.5%	16.5%	15.3%
TELE2 NETHERLANDS HOLDING NV	5.3%	5.3%	3.8%	16.0%	16.0%	1.5%	21.3%	21.3%	5.3%	23%	16.5%	16.5%	4.1%
SER SYSTEMS AG	4.9%	5.0%	4.2%	16.0%	16.0%	3.5%	20.9%	21.0%	7.7%	30%	14.7%	14.7%	5.4%
JAZZTEL PLC	5.1%	4.5%	4.0%	16.0%	16.0%	16.0%	21.1%	20.5%	20.0%	28%	15.3%	14.8%	14.5%
WWL INTERNET AG	4.4%	4.6%	4.3%	16.0%	16.0%	4.3%	20.4%	20.6%	8.6%	30%	14.3%	14.5%	6.1%
BAEURER AG	4.4%	4.6%	4.3%	16.0%	5.5%	14.0%	20.4%	10.1%	18.3%	30%	14.3%	7.1%	12.9%
ASPIRO AB	5.0%	5.0%	5.0%	16.0%	16.0%	16.0%	21.0%	21.0%	21.0%	28%	15.1%	15.1%	15.1%
LIBERTY GLOBAL EUROPE-A	5.3%	5.3%	3.8%	16.0%	16.0%	13.0%	21.3%	21.3%	16.8%	23%	16.5%	16.5%	13.0%
JOMED NV	5.3%	5.3%	3.8%	1.5%	13.0%	5.5%	6.8%	18.3%	9.3%	23%	5.3%	14.2%	7.2%
AGIPLAN TECHNOSOFT AG	5.1%	4.2%	4.2%	1.5%	1.0%	0.6%	6.6%	5.2%	4.8%	30%	4.6%	3.6%	3.4%
GEOSENTRIC OYJ	5.3%	4.2%	4.3%	16.0%	16.0%	3.5%	21.3%	20.2%	7.8%	26%	15.7%	14.9%	5.8%
GARANT SCHUH & MODE AG-VORZU	4.0%	4.1%	3.1%	10.0%	5.5%	5.5%	14.0%	9.6%	8.6%	30%	9.8%	6.8%	6.1%
PGAM ADVANCED TECHNOLOGIES	4.2%	3.6%	4.0%	4.3%	5.5%	5.5%	8.5%	9.1%	9.5%	30%	5.9%	6.4%	6.6%
NOVEMBER AG	3.1%	3.7%	4.3%	16.0%	16.0%	1.0%	19.1%	19.7%	5.3%	30%	13.4%	13.8%	3.7%
WCM BETEILIGUNGS & GRUND AG	3.5%	3.8%	4.1%	16.0%	16.0%	16.0%	19.5%	19.8%	20.1%	30%	13.7%	13.9%	14.1%
SCANMINING AB	5.0%	5.0%	5.0%	16.0%	16.0%	16.0%	21.0%	21.0%	21.0%	28%	15.1%	15.1%	15.1%
INKU AG	4.4%	3.7%	3.7%	16.0%	16.0%	16.0%	20.4%	19.7%	19.7%	25%	15.3%	14.8%	14.8%
EAG-BETEILIGUNGS AG	4.4%	3.7%	3.7%	16.0%	16.0%	16.0%	20.4%	19.7%	19.7%	25%	15.3%	14.8%	14.8%
KAMPA AG	3.9%	3.1%	3.1%	16.0%	16.0%	4.0%	19.9%	19.1%	7.1%	30%	14.0%	13.4%	5.0%
ORCO PROPERTY GROUP	3.9%	3.1%	3.1%	16.0%	16.0%	16.0%	19.9%	19.1%	19.1%	30%	14.0%	13.4%	13.4%
ARCANDOR AG	4.6%	3.6%	2.6%	16.0%	16.0%	16.0%	20.6%	19.6%	18.6%	30%	14.5%	13.8%	13.0%
EDOB ABWICKLUNGS AG	4.2%	3.4%	2.1%	16.0%	16.0%	16.0%	20.2%	19.4%	18.1%	30%	14.2%	13.6%	12.7%
Average	4.6%	4.3%	4.0%	14.2%	14.1%	10.5%	18.9%	18.4%	14.4%		13.7%	13.4%	10.5%

Source: author

Our COD_{FY-1} comes in at 13.7%, 13.4% for the COE_{FY}, and 10.5% for the COE_{FY1}. First remark we should make is that the COD_{FY-1} and COD_{FY} are not very different meaning that the credit quality of the firms one year before restructuring was already very poor leading to an inevitable restructuring. This is also underpinned by the high absolute levels of the COD. Our COD_{FY1} is much lower and in line with a supposedly better quality of a firm (with stronger credit metrics and ratios) that has just come out of a restructuring.

The absolute levels between our COD in the first and second approach significantly differ despite the better credit quality of the new emerging firm. This is due to:

- The excess over a fair cost of debt demanded by investors by holding a risky asset with an uncertain financial future ahead of it.
- Common mispricing in this type of distressed situation with conflicts of interests throughout the capital structure rebalancing.

Therefore, it is reasonable that the real and the implied COD differ from each other in such a way despite the significant improvement of the company in terms of credit quality and liquidity (and also leverage). The table below shows the difference between COD under approach 1 and 2. On average, the difference between both methods significantly widens in FY1 by 314bps vs 121bps in FY as the debt investors price in a premium in their holdings of the company relative to the stronger credit profile of the emerging

company. In FY-1 the difference is small implying that the investors are correctly pricing the COD given the companies' outlook and the credit metrics.

P&L based COD – Synthetic COD

Name	FY-1	FY	FY1
MICROLOGICA AG	(1,083bps)	(1,083bps)	610bps
PERFECT HOLDING SA	-	-	560bps
SAUNALAHTI GROUP OYJ	-	1,282bps	-
ALVERN NORWAY ASA	(1,104bps)	(1,090bps)	(571bps)
COMPLETEL	(138bps)	(245bps)	(670bps)
TELE2 NETHERLANDS HOLDING NV	(428bps)	(404bps)	546bps
SER SYSTEMS AG	-	-	878bps
JAZZTEL PLC	(479bps)	(193bps)	(433bps)
WWL INTERNET AG	(749bps)	(552bps)	269bps
BAEURER AG	(446bps)	(238bps)	(834bps)
ASPIRO AB	53bps	1,331bps	(44bps)
LIBERTY GLOBAL EUROPE-A	(504bps)	(496bps)	(709bps)
JOMED NV	369bps	(586bps)	103bps
AGIPLAN TECHNOSOFT AG	176bps	431bps	459bps
GEOSENTRIC OYJ	-	861bps	925bps
GARANT SCHUH & MODE AG-VORZU	(201bps)	(96bps)	(96bps)
PGAM ADVANCED TECHNOLOGIES	821bps	737bps	737bps
NOVEMBER AG	-	-	1,455bps
WCM BETEILIGUNGS & GRUND AG	1,296bps	1,560bps	1,082bps
SCANMINING AB	-	474bps	-
INKU AG	476bps	354bps	354bps
EAG-BETEILIGUNGS AG	156bps	1,241bps	2,503bps
KAMPA AG	521bps	(664bps)	305bps
ORCO PROPERTY GROUP	(743bps)	(884bps)	(674bps)
ARCANDOR AG	(361bps)	(72bps)	(72bps)
EDOB ABWICKLUNGS AG	281bps	1,469bps	1,469bps
Average	(80bps)	121bps	314bps

Source: author

Below a table with the scoring, blended rating and the spread attached under Approach 3. This should be the spread levels if the credit metrics were exclusively the main driver of the excess over the RFA.

	Scoring			Blended rating			Spread		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
MICROLOGICA AG	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
PERFECT HOLDING SA	7.0	7.0	6.2	D	D	CCC-	16.0%	16.0%	9.0%
SAUNALAHTI GROUP OYJ	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
ALVERN NORWAY ASA	7.0	7.0	6.3	D	D	CCC-	16.0%	16.0%	9.0%
COMPLETEL	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
TELE2 NETHERLANDS HOLDING NV	7.0	7.0	2.6	D	D	A-	16.0%	16.0%	1.5%
SER SYSTEMS AG	7.0	7.0	4.5	D	D	BB+	16.0%	16.0%	3.5%
JAZZTEL PLC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
WWL INTERNET AG	7.0	7.0	5.0	D	D	B+	16.0%	16.0%	4.3%
BAEURER AG	7.0	6.8	6.8	D	C	C	16.0%	5.5%	14.0%
ASPIRO AB	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
LIBERTY GLOBAL EUROPE-A	7.0	7.0	6.6	D	D	C+	16.0%	16.0%	13.0%
JOMED NV	2.8	6.6	5.9	A-	C+	B-	1.5%	13.0%	5.5%
AGIPLAN TECHNOSOFT AG	5.0	2.1	1.4	B+	A+	AA+	1.5%	1.0%	0.6%
GEOSENTRIC OYJ	7.0	7.0	4.2	D	D	BB+	16.0%	16.0%	3.5%
GARANT SCHUH & MODE AG-VORZU	6.4	5.9	5.9	CC+	B-	B-	10.0%	5.5%	5.5%
PGAM ADVANCED TECHNOLOGIES	5.5	5.9	5.9	B+	B-	B-	4.3%	5.5%	5.5%
NOVEMBER AG	7.0	7.0	2.1	D	D	A+	16.0%	16.0%	1.0%
WCM BETEILIGUNGS & GRUND AG	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
SCANMINING AB	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
INKU AG	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
EAG-BETEILIGUNGS AG	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
KAMPA AG	7.0	7.0	4.5	D	D	BB	16.0%	16.0%	4.0%
ORCO PROPERTY GROUP	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
ARCANDOR AG	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
EDOB ABWICKLUNGS AG	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
Average	**6.7**	**6.7**	**5.8**				**14.2%**	**14.1%**	**10.5%**

Source: author

In the table above we can observe the weakness of the credit scoring of the companies in FY-1 and FY as expected, boding well with a D rating given their poor credit metrics and the looming corporate event. The average spread in both periods stands at 14% under our synthetic rating framework given the weak credit quality of the firms. In FY1 the credit scoring significantly improves, mostly in terms of profitability (FFO/Debt) and leverage (Debt/Ebitda) bringing the scoring down to 5.8 boding well for a B average rating, a common credit rating[50] for a restructured company. The spread attached to this rating should be in the 10.5% region, still high as a consequence of the inherent risk, but markedly down from the distressed levels at around the restructuring time.

Please refer to the appendix to see key credit metrics, rating per credit metric, the blended credit rating and the spread attached to it.

[50] According to S&P, Moody's, Fitch.

2.3 Capital Structure weighting

For the capital structure weighting (Debt and Equity to Capital) we use our market based approach which seeks to capture the market value of the capital sources at each point in time rather the book value oriented methodologies which is based on historical values. In a distressed company, to use book values can severely distort the analysis as these values might have been recorded in the balance sheet long before the company came under distress. By turning to the market values, we can ascertain the fair value of the financing sources (which can suggest the expected recovery) on a mark to market basis.

As far as the equity is concerned, we use the market capitalization. This task is fairly straightforward as we look back to the market capitalization of the companies at the time, free of preference shares. As for the debt, it becomes a more intricate task as we lack publicly market prices of corporate debt through our period. Moreover some of the corporate debt itself does not usually trade in the past[51] so it is difficult to estimate the market price of this debt. Notwithstanding that, we still go through to our market based WACC route and we use our approach 2 in the chapter 2.2.2 whereby we treat all the debt as a coupon bond with the average maturity of the entire debt pool of the balance sheet at the time. We value the bond by discounting it at the P&L based COD (approach 1). We make a very sensitive and arguable assumption for the market value of debt in FY1. We have converted the book value of debt in FY-1 and FY into a market coupon bond to factor the financial distress of the companies into the debt. By doing the same in FY1 we would be treating the debt pre and post distress under the same standards which arguably could be incorrect as we assume the company emerged from bankruptcy with a bolstered capital structure as proven by looking at the balance sheet. We could have applied some sort of "haircut" to the debt but given the P/B[52] is trading above 0.65x in both samples, we could infer the debt could be trading between 80c-100c so to avoid further assumptions in our model we take book value as a proxy.

In the table below we can observe the moving parts of the weightings across the board (we have excluded Liberty Global given the mounting negative equity to avoid misrepresentation in our analysis). We see a fall in gross debt by 19% and an increase of equity by 86% between FY and FY1 suggesting the important liability management to shore up the capital structure. D/E falls to 4.6x from the highs of 10.6x in FY. As a consequence, the market based D/E, which happens to be our weighting for the WACC, increases from 1.1x in FY-1 to 4.6x to come up to 7.0x in FY1.

[51] We can think of revolving credit facilities, bilateral loans etc.

[52] P/B = Price to Book → Market capitalisation / book equity. Also called P/NAV (Net Asset Value).

	FY-1	FY	FY1
Debt			
Book value	18,304	18,572	15,048
% change		1%	-19%
Market value	8,749	8,467	15,048
% change		-3%	78%
% of book value	48%	46%	100%
Equity			
Book value	2,377	1,750	3,253
% change		-26%	86%
Market value	7,852	1,841	2,145
% change		-77%	17%
% of book value	330%	105%	66%
D/E			
Book value	7.7x	10.6x	4.6x
Market value	1.1x	4.6x	7.0x

Source: author

See appendix for more details per company.

2.4 WACC

Once we have estimated our COD, COE and the weightings, we then proceed to determine the individual and the global WACC for our sample.

	FY-1 WACC				FY WACC				FY1 WACC			
Name	Equity %	Debt %	WACC (P&L)	WACC (Synt)	Equity %	Debt %	WACC (P&L)	WACC (Synt)	Equity %	Debt %	WACC (P&L)	WACC (Synt)
MICROLOGICA AG	97%	3%	6.5%	6.8%	92%	8%	7.7%	6.8%	37%	63%	16.8%	6.8%
PERFECT HOLDING SA	97%	3%	9.6%	9.6%	51%	49%	12.4%	9.6%	77%	23%	10.6%	9.4%
SAUNALAHTI GROUP OYJ	99%	1%	9.6%	9.6%	115%	-15%	9.3%	9.6%	53%	47%	9.5%	9.6%
ALVERN NORWAY ASA	15%	85%	5.3%	14.7%	7%	93%	6.0%	14.9%	5%	95%	5.4%	10.3%
COMPLETEL	57%	43%	13.4%	14.0%	47%	53%	14.3%	14.0%	91%	9%	11.9%	13.5%
TELE2 NETHERLANDS HOLDING NV	49%	51%	13.4%	15.6%	14%	86%	12.9%	15.6%	92%	8%	5.5%	9.3%
SER SYSTEMS AG	89%	11%	15.5%	15.5%	17%	83%	15.0%	15.5%	9%	91%	13.5%	14.5%
JAZZTEL PLC	30%	70%	10.8%	14.2%	24%	76%	12.9%	13.9%	63%	37%	7.3%	13.6%
WWL INTERNET AG	94%	6%	8.7%	9.1%	70%	30%	12.7%	9.1%	36%	64%	8.0%	8.6%
BAEURER AG	63%	37%	8.9%	10.5%	32%	68%	5.4%	7.8%	22%	78%	5.4%	10.0%
ASPIRO AB	100%	0%	19.4%	19.4%	154%	-54%	17.0%	19.4%	99%	1%	9.6%	19.4%
LIBERTY GLOBAL EUROPE-A	5%	95%	11.9%	16.6%	1%	99%	11.6%	16.6%	1%	99%	6.0%	13.3%
JOMED NV	98%	2%	14.5%	14.4%	87%	13%	14.7%	14.5%	3%	97%	8.3%	14.4%
AGIPLAN TECHNOSOFT AG	99%	1%	5.4%	5.4%	93%	7%	12.8%	5.4%	87%	13%	11.6%	5.4%
GEOSENTRIC OYJ	97%	3%	8.3%	8.3%	104%	-4%	11.2%	8.2%	47%	53%	11.2%	7.9%
GARANT SCHUH & MODE AG-VORZU	25%	75%	7.0%	8.5%	14%	86%	6.1%	6.2%	8%	92%	5.1%	5.7%
PGAM ADVANCED TECHNOLOGIES	81%	19%	11.0%	9.5%	65%	35%	16.3%	9.5%	3%	97%	14.0%	9.6%
NOVEMBER AG	99%	1%	6.5%	6.5%	100%	0%	8.5%	6.5%	97%	3%	7.7%	6.4%
WCM BETEILIGUNGS & GRUND AG	52%	48%	17.0%	10.8%	38%	62%	22.9%	10.9%	5%	95%	24.1%	11.0%
SCANMINING AB	96%	4%	7.0%	7.0%	93%	7%	14.8%	7.0%	67%	33%	38.0%	7.0%
INKU AG	77%	23%	10.6%	9.5%	99%	1%	13.2%	9.4%	93%	7%	11.5%	9.4%
EAG-BETEILIGUNGS AG	36%	64%	13.5%	12.5%	32%	68%	23.1%	12.1%	7%	93%	37.5%	12.1%
KAMPA AG	96%	4%	5.6%	5.4%	85%	15%	6.4%	5.4%	31%	69%	7.7%	5.1%
ORCO PROPERTY GROUP	38%	62%	7.7%	12.3%	5%	95%	5.1%	11.9%	5%	95%	6.8%	12.0%
ARCANDOR AG	50%	50%	11.3%	13.1%	18%	82%	13.5%	12.8%	1%	99%	12.3%	12.4%
EDOB ABWICKLUNGS AG	68%	32%	12.1%	11.2%	55%	45%	15.9%	11.1%	3%	97%	26.7%	10.8%
Average			**10.4%**	**11.2%**			**12.4%**	**10.9%**			**12.8%**	**10.3%**

Source: author

The outcome is as follows:

- Approach 1 (P&L based WACC)
  - $WACC_{FY-1}$: 10.4%

- $WACC_{FY}$: 12.4%
- $WACC_{FY1}$: 12.8%

- Approach 2 (Synthetic rating based WACC)
  - $WACC_{FY-1}$: 11.2%
  - $WACC_{FY}$: 10.9%
  - $WACC_{FY1}$: 10.3%

Under Approach 1, WACC reaches its highest levels after the restructuring. It might look odd as first sight as a new "clean" company is expected to emerge from restructuring and therefore boasts stronger credit and financial metrics with a more sound and viable capital structure. However, investors tend to factor in a premium for different reasons. These could be

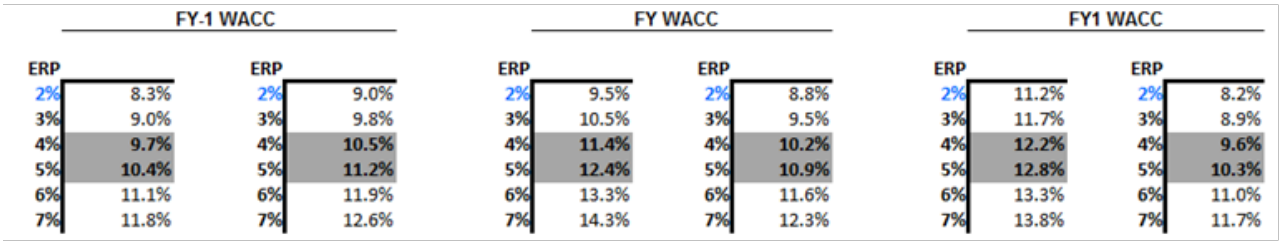
- Risk aversion in a new entity with an ongoing risk of failure.
- Concerns on the outcome of the restructuring process ("non-manageable" capital structure, unsuitable management team, future business viability, etc) that calls for a premium. This bodes well with the "efficiency of the restructuring" thesis that we have highlighted before. We will discuss it at the end of this section.

Under approach 2, $WACC_{FY-1}$ and $WACC_{FY}$ stand at the highs of 11% which is consistent with a distressed company. However, our $WACC_{FY1}$ falls below 10.5% in line with the theoretical cost of capital of a newly restructured company with stronger credit metrics. The difference between our $WACC_{FY1}$ under both scenarios is significant and account for the market premium required by the investors[53]. This is an obvious explanation. Investors have to be compensated for holding a risky asset even after the restructuring as the likelihood of failure is again much higher than that of any other corporate. Even if the financial and credit quality of the companies have markedly improved, the market perception of the restructuring process in general and capital structure in particular might still cause concerns to investors. We will interpret these results at the end of the section

2.4.1 WACC sensitivity: the ERP as a key driver

We have highlighted throughout section 2 the relevance of the ERP and its powerful impact on the WACC. It is paramount to correctly choose a reliable ERP not to misinterpret the outcome. Since academics and practitioners still disagree on the best methodology to estimate the ERP, it has become a very subjective judgment and hence it could compromise the estimation of the cost of capital. As describe in section 2, one can estimate the ERP by using the historical average (4%-6% for the S&P 500 as the equity benchmark), by running a regression, or adjusting the ERP for the CRP. Notwithstanding that, the ERP will always incorporate some sort of personal judgment. Therefore, it is important to always provide for a range of potential values for the WACC (and not just a single value) to account for the powerful driving effect of the ERP.

[53] The WACC shows here the average cost of capital but also the return demanded by investors.



Source: author

We have used a 5% ERP by default, the level that market practitioners tend to use, which is the arithmetic average of the S&P 500 between 1970-2009.

We can observe how the WACC changes by 500bps-600bps (or by 1,000bps in FY) by shifting the ERP up and down by 100bps implying the need to correctly estimate the WACC. If we are not too confident about our ERP estimation, a sensitivity exercise on the WACC will allow us to gauge the accuracy of the cost of capital on the basis of our chosen ERP.

3 American sample: WACC analysis

In section 1 we have extensively discussed the merits of Chapter 11 as restructuring mechanism for distressed companies. Its powerful features such as the stay, cramdowns, super senior financing enable an efficient restructuring towards a full rehabilitation of the company through a comprehensive capital structure management. Thus, we are expecting a wider sample of companies than the European one supported by three facts:

1. The long lasting tradition of corporate restructuring within US and the assumption that companies are worth more as a going concern than as a gone concern.

2. The aversion of the American business culture to acknowledge failure. Liquidation implies failure, inability to resolve the problem, something which is heavily penalized by the markets and the public opinion. Management and investors are always scrutinized by the markets and when a failure occurs, the former is criticized by its inability to restore the business and the latter by its inability to envisage the fallout. This might give rise an irreversible social and professional stigma on both actors.

3. The lack of bank related financing in the capital markets which are fundamentally led and governed by the bond market. The bond market is usually characterized by sophisticated investors “hunting” for yield who are willing to forego collateral or protection for a higher yield in their investments. These investors understand the risk reward of their investments and the benefits and perils of a corporate restructuring (Chapter 11) which actually become very helpful through the restructuring process as they are experienced in this type of distressed situations.

Chapter 11 is a fairly debtor friendly framework that aims to protect the company through a comprehensive “tool kit” and enhance its value through a workout of the capital structure thanks to a profound interaction between all security holders in the firm. This fact coupled with the absence of banks in the capital financing prompts Chapter 11 as an effective and efficient restructuring proceeding to turn companies around. As pointed out in the section 3.1.3 banks are more prone to liquidation as they usually “sit” in the more senior layers of the capital structure enjoying valuable collateral ensuring them a high recovery rate under liquidation (James 1995).

Our American sample comes out at 46 publicly traded companies down from more than a thousand companies that filed for a corporate restructuring/liquidation. As per the European sample, we have removed all companies that were privatized over the restructuring process or otherwise were liquidated. Likewise, we have left small companies that remained public after emerging from Chapter 11 out of the sample as the size of the companies and the quality of the financial data was not reliable. The purpose is to avoid potential flaws (biases or skews) that could compromise the outcome.

Our sample comprises firms across various industries including cyclical and non cyclical, telecommunications, or industrial companies. These are sectors used to frequently undergoing corporate restructurings[54] which have naturally changed the business model and the capital structure of their corporate incumbents. The latter have witnessed an array of sophisticated subordinated investors[55] coming into the capital that understand the restructuring process and their risk and rewards. It is the sophistication and the pragmatism of Chapter 11 through the interaction of high caliber investors that makes it so efficient in terms of outcome and timing.

Below our sample of distressed American companies:

[54] Not only distressed restructuring but LBO, MBOs, spin offs, mergers, carve outs, etc are quite common in the American corporate space (Rosenbaum 2008).

[55] Hedge Fund, Private Equities etc.

				WACC dates		
Name	Sector	Country	Filing date	FY-1	FY	FY1
SMC VENTURES INC	Consumer, Non-cyclical	US	20/12/2001	31/12/2000	20/12/2001	31/12/2002
CYTOMEDIX INC	Consumer, Non-cyclical	US	07/08/2001	31/08/2000	07/08/2001	31/08/2002
USG CORP	Industrial	US	25/06/2001	30/06/2000	25/06/2001	30/06/2002
FRIEDE GOLDMAN HALTER INC	Energy	US	19/04/2001	30/04/2000	19/04/2001	30/04/2002
PROTEONOMIX INC	Consumer, Non-cyclical	US	02/02/2001	29/02/2000	02/02/2001	28/02/2002
RADNET INC	Consumer, Non-cyclical	US	05/09/2003	30/09/2002	05/09/2003	30/09/2004
AMERICAN WAGERING INCORP	Consumer, Cyclical	US	25/07/2003	31/07/2002	25/07/2003	31/07/2004
AMERCO	Industrial	US	20/06/2003	30/06/2002	20/06/2003	30/06/2004
WEIRTON STEEL CORP	Basic Materials	US	19/05/2003	31/05/2002	19/05/2003	31/05/2004
RAHAXI INC	Communications	US	09/01/2003	31/01/2002	09/01/2003	31/01/2004
PRESIDENT CASINOS INC	Consumer, Cyclical	US	20/06/2002	30/06/2001	20/06/2002	30/06/2003
NATIONAL STEEL CORP-CL B	Basic Materials	US	06/03/2002	31/03/2001	06/03/2002	31/03/2003
ZAP	Consumer, Cyclical	US	01/03/2002	31/03/2001	01/03/2002	31/03/2003
SOFTLOCK.COM INC	Communications	US	16/04/2002	30/04/2001	16/04/2002	30/04/2003
HERBORIUM GROUP INC	Consumer, Non-cyclical	US	11/05/2005	31/05/2004	11/05/2005	31/05/2006
COMPOSITE TECHNOLOGY CORPORA	Industrial	US	05/05/2005	31/05/2004	05/05/2005	31/05/2006
INTELLIGENT COMMUNICATION EN	Communications	US	18/03/2003	31/03/2002	18/03/2003	31/03/2004
EPICUS COMMUNICATIONS GROUP	Communications	US	25/10/2004	31/10/2003	25/10/2004	31/10/2005
AIR INDUSTRIES GROUP INC	Industrial	US	15/10/2004	31/10/2003	15/10/2004	31/10/2005
NEWTON ENERGY CORP	Energy	US	15/10/2004	31/10/2003	15/10/2004	31/10/2005
MEDIA 100 INC	Technology	US	22/03/2004	31/03/2003	22/03/2004	31/03/2005
INTL THOROUGHBRED BREEDERS	Consumer, Cyclical	US	04/12/2006	31/12/2005	04/12/2006	31/12/2007
MEDICAL STAFFING SOLUTIONS I	Consumer, Non-cyclical	US	27/12/2006	31/12/2005	27/12/2006	31/12/2007
U.S. ENERGY SYSTEMS INC	Energy	US	29/11/2006	30/11/2005	29/11/2006	30/11/2007
PILGRIM'S PRIDE CORP	Consumer, Non-cyclical	US	08/08/2003	31/08/2002	08/08/2003	31/08/2004
GBO INC	Industrial	US	11/06/2004	30/06/2003	11/06/2004	30/06/2005
PROLOGIC MANAGEMENT SYSTEMS	Technology	US	02/02/2004	28/02/2003	02/02/2004	28/02/2005
FACTORY 2-U STORES INC	Consumer, Cyclical	US	13/01/2004	31/01/2003	13/01/2004	31/01/2005
SIRICOMM INC	Communications	US	27/12/2007	31/12/2006	27/12/2007	31/12/2008
CHESAPEAKE CORP	Industrial	US	29/12/2008	31/12/2007	29/12/2008	31/12/2009
TELEMETRIX INC	Communications	US	16/12/2008	31/12/2007	16/12/2008	31/12/2009
PFF BANCORP INC	Financial	US	05/12/2008	31/12/2007	05/12/2008	31/12/2009
INTROGEN THERAPEUTICS INC	Consumer, Non-cyclical	US	03/12/2008	31/12/2007	03/12/2008	31/12/2009
BUTLER INTL INC	Consumer, Non-cyclical	US	01/06/2009	30/06/2008	01/06/2009	30/06/2010
MOTORS LIQUIDATION CO	Consumer, Cyclical	US	01/06/2009	30/06/2008	01/06/2009	30/06/2010
VISTEON CORP	Consumer, Cyclical	US	28/05/2009	31/05/2008	28/05/2009	31/05/2010
CAPITAL CORP OF THE WEST	Financial	US	11/05/2009	31/05/2008	11/05/2009	31/05/2010
CIB MARINE BANCSHARES INC	Financial	US	15/09/2009	30/09/2008	15/09/2009	30/09/2010
WALKING CO HOLDINGS INC/THE	Consumer, Cyclical	US	07/12/2009	31/12/2008	07/12/2009	31/12/2010
COOPER-STANDARD HOLDING	Industrial	US	03/08/2009	31/08/2008	03/08/2009	31/08/2010
LUNA INNOVATIONS INC	Industrial	US	17/07/2009	31/07/2008	17/07/2009	31/07/2010
MEDCOM USA	Telecommunications	US	21/04/2009	30/04/2008	21/04/2009	30/04/2010
ASYST TECHNOLOGIES INC	Telecommunications	US	20/04/2009	30/04/2008	20/04/2009	30/04/2010
ABITIBIBOWATER INC	Industrial	US	16/04/2009	30/04/2008	16/04/2009	30/04/2010
GENERAL GROWTH PROPERTIES	Real Estate	US	16/04/2009	30/04/2008	16/04/2009	30/04/2010
HOWARD HUGHES CORP/THE	Real Estate	US	16/04/2009	30/04/2008	16/04/2009	30/04/2010

Source: Author

As per the European sample, we undertake the same process to estimate our WACC for the American sample. We first look at the cost of equity and debt to later calibrate the weightings and finally evaluate the WACC and its sensitivity to the ERP.

3.1 Cost of equity

We follow the CAPM model to come up with the COE for our sample.

	COST OF EQUITY (COE)											
	RFA			Adjusted Beta			ERP			COE		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
SMC VENTURES INC	5.1%	5.0%	3.8%	0.29	0.25	0.26	5%	5%	5%	6.6%	6.3%	5.1%
CYTOMEDIX INC	5.7%	5.2%	4.1%	0.56	0.65	1.40	5%	5%	5%	8.5%	8.4%	11.1%
USG CORP	6.0%	5.1%	4.8%	0.45	1.23	1.00	5%	5%	5%	8.3%	11.3%	9.8%
FRIEDE GOLDMAN HALTER INC	6.2%	5.3%	5.1%	0.09	1.28	1.29	5%	5%	5%	6.6%	11.7%	11.5%
PROTEONOMIX INC	6.4%	5.2%	4.9%	0.21	0.87	1.10	5%	5%	5%	7.4%	9.5%	10.4%
RADNET INC	3.6%	4.4%	4.1%	0.31	0.49	1.20	5%	5%	5%	5.1%	6.8%	10.1%
AMERICAN WAGERING INCORP	4.5%	4.2%	4.5%	2.10	2.00	1.50	5%	5%	5%	15.0%	14.2%	12.0%
AMERCO	4.8%	3.4%	4.6%	0.80	1.15	2.71	5%	5%	5%	8.8%	9.1%	18.1%
WEIRTON STEEL CORP	5.0%	3.5%	4.7%	0.35	0.80	0.70	5%	5%	5%	6.8%	7.5%	8.2%
RAHAXI INC	5.0%	4.2%	4.1%	1.30	1.58	1.05	5%	5%	5%	11.5%	12.1%	9.4%
PRESIDENT CASINOS INC	5.4%	4.8%	3.5%	1.35	1.80	0.95	5%	5%	5%	12.2%	13.8%	8.3%
NATIONAL STEEL CORP-CL B	4.9%	5.1%	3.8%	1.59	0.74	0.85	5%	5%	5%	12.9%	8.8%	8.1%
ZAP	4.9%	5.0%	3.8%	1.28	1.50	1.26	5%	5%	5%	11.3%	12.5%	10.1%
SOFTLOCK.COM INC	5.3%	5.2%	3.8%	2.11	2.20	1.70	5%	5%	5%	15.9%	16.2%	12.4%
HERBORIUM GROUP INC	4.7%	4.2%	5.1%	2.60	2.58	1.92	5%	5%	5%	17.7%	17.1%	14.7%
COMPOSITE TECHNOLOGY CORPORA	4.7%	4.2%	5.1%	2.13	1.39	1.36	5%	5%	5%	15.3%	11.1%	11.9%
INTELLIGENT COMMUNICATION EN	5.4%	3.9%	3.8%	1.80	2.28	0.43	5%	5%	5%	14.4%	15.3%	6.0%
EPICUS COMMUNICATIONS GROUP	4.3%	4.0%	4.6%	3.80	4.67	2.10	5%	5%	5%	23.3%	27.3%	15.1%
AIR INDUSTRIES GROUP INC	4.3%	4.1%	4.6%	1.80	2.10	1.12	5%	5%	5%	13.3%	14.6%	10.2%
NEWTON ENERGY CORP	4.3%	4.1%	4.6%	2.46	2.75	1.4	5%	5%	5%	16.6%	17.8%	11.6%
MEDIA 100 INC	3.8%	3.7%	4.5%	0.27	1.80	1.20	5%	5%	5%	5.1%	12.7%	10.5%
INTL THOROUGHBRED BREEDERS	4.4%	4.4%	4.0%	3.48	3.85	1.80	5%	5%	5%	21.8%	23.7%	13.0%
MEDICAL STAFFING SOLUTIONS I	4.4%	4.7%	4.0%	1.35	1.90	1.25	5%	5%	5%	11.1%	14.2%	10.3%
U.S. ENERGY SYSTEMS INC	4.5%	4.5%	3.9%	0.90	1.05	1.20	5%	5%	5%	9.0%	9.8%	9.9%
PILGRIM'S PRIDE CORP	4.0%	2.7%	3.8%	0.56	0.41	0.93	5%	5%	5%	6.8%	4.8%	8.5%
GBO INC	3.5%	4.8%	3.9%	0.83	1.12	0.95	5%	5%	5%	7.7%	10.4%	8.7%
PROLOGIC MANAGEMENT SYSTEMS	3.7%	4.1%	4.4%	0.65	0.95	0.96	5%	5%	5%	6.9%	8.9%	9.2%
FACTORY 2-U STORES INC	4.0%	4.0%	4.1%	1.80	2.10	1.69	5%	5%	5%	13.0%	14.5%	12.6%
SIRICOMM INC	4.7%	4.2%	2.2%	2.38	1.80	0.55	5%	5%	5%	16.6%	13.2%	5.0%
CHESAPEAKE CORP	4.0%	2.1%	3.8%	1.39	2.99	2.40	5%	5%	5%	11.0%	17.1%	15.8%
TELEMETRIX INC	4.0%	2.3%	3.8%	2.11	2.20	1.70	5%	5%	5%	14.6%	13.3%	12.4%
PFF BANCORP INC	4.0%	2.7%	3.8%	1.65	1.25	2.85	5%	5%	5%	12.3%	9.0%	18.1%
INTROGEN THERAPEUTICS INC	4.0%	2.7%	3.8%	0.98	1.84	2.62	5%	5%	5%	8.9%	11.8%	16.9%
BUTLER INTL INC	4.0%	3.7%	2.9%	0.47	0.77	0.40	5%	5%	5%	6.3%	7.5%	4.9%
MOTORS LIQUIDATION CO	4.0%	3.7%	2.9%	2.05	2.63	1.67	5%	5%	5%	14.2%	16.8%	11.3%
VISTEON CORP	4.1%	3.6%	3.3%	1.69	2.80	1.98	5%	5%	5%	12.5%	17.6%	13.2%
CAPITAL CORP OF THE WEST	4.1%	3.2%	3.3%	0.05	1.92	1.52	5%	5%	5%	4.3%	12.8%	10.9%
CIB MARINE BANCSHARES INC	3.8%	3.5%	2.5%	1.30	1.58	1.05	5%	5%	5%	10.3%	11.4%	7.8%
WALKING CO HOLDINGS INC/THE	2.2%	3.4%	2.7%	1.15	1.23	0.79	5%	5%	5%	8.0%	9.6%	6.6%
COOPER-STANDARD HOLDING	2.2%	3.4%	2.7%	1.40	1.55	0.86	5%	5%	5%	9.2%	11.2%	7.0%
LUNA INNOVATIONS INC	2.2%	3.4%	2.7%	1.13	0.16	0.46	5%	5%	5%	7.9%	4.2%	5.0%
MEDCOM USA	2.2%	3.4%	2.7%	0.86	1.82	0.46	5%	5%	5%	6.5%	12.5%	5.0%
ASYST TECHNOLOGIES INC	2.2%	3.4%	2.7%	0.98	4.70	2.03	5%	5%	5%	7.1%	26.9%	12.8%
ABITIBIBOWATER INC	2.2%	3.4%	2.7%	2.68	2.16	1.45	5%	5%	5%	15.6%	14.2%	9.9%
GENERAL GROWTH PROPERTIES	2.2%	3.4%	2.7%	2.12	8.17	2.30	5%	5%	5%	12.8%	44.3%	14.2%
HOWARD HUGHES CORP/THE	2.2%	3.4%	2.7%	1.79	1.85	1.11	5%	5%	5%	11.2%	12.7%	8.2%
Average	**4.2%**	**4.0%**	**3.8%**	**1.38**	**1.89**	**1.34**	**5.0%**	**5.0%**	**5.0%**	**11.0%**	**13.4%**	**10.5%**

Source: Author

Our COE comes in at 11.0% for the COE_{FY-1}, 13.4% for the COE_{FY}, and 10.5% for the COE_{FY1} .As expected, the COE at the filing day reaches its highest levels. Our COE_{FY1} comes in significantly lower than the COE_{FY} due to a full workaround on the capital structure that sees the D/E ratio markedly down from the 600%ish to the 200%ish, releasing some of the risk from the equity holders.

3.2 Cost of debt

As we have done for the European sample, we conduct the cost of debt analysis under approach 1 (P&L method) and 2 (Synthetic method).

3.2.1 Cost of debt under Approach 1

	COST OF DEBT (COD)												
	RFA			Spread			COD			Tax Rate	Post Tax COD		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1		FY-1	FY	FY1
SMC VENTURES INC	5.1%	5.0%	3.8%	12.8%	7.3%	11.2%	18%	12%	15%	30%	12.5%	8.6%	10.5%
CYTOMEDIX INC	5.7%	5.2%	4.1%	5.5%	5.5%	10.0%	11%	11%	14%	30%	7.9%	7.5%	9.9%
USG CORP	6.0%	5.1%	4.8%	7.4%	7.1%	10.7%	13%	12%	15%	30%	9.4%	8.6%	10.8%
FRIEDE GOLDMAN HALTER INC	6.2%	5.3%	5.1%	10.8%	12.1%	14.0%	17%	17%	19%	30%	11.9%	12.2%	13.4%
PROTEONOMIX INC	6.4%	5.2%	4.9%	9.4%	5.1%	10.1%	16%	10%	15%	30%	11.1%	7.2%	10.5%
RADNET INC	3.6%	4.4%	4.1%	9.0%	10.5%	9.8%	13%	15%	14%	30%	8.8%	10.4%	9.7%
AMERICAN WAGERING INCORP	4.5%	4.2%	4.5%	11.3%	8.5%	7.0%	16%	13%	11%	30%	11.0%	8.9%	8.0%
AMERCO	4.8%	3.4%	4.6%	7.7%	9.1%	8.9%	13%	12%	13%	30%	8.8%	8.7%	9.4%
WEIRTON STEEL CORP	5.0%	3.5%	4.7%	10.6%	4.5%	9.4%	16%	8%	14%	30%	10.9%	5.6%	9.8%
RAHAXI INC	5.0%	4.2%	4.1%	2.4%	3.2%	12.8%	7%	7%	17%	30%	5.2%	5.2%	11.9%
PRESIDENT CASINOS INC	5.4%	4.8%	3.5%	14.0%	13.9%	14.7%	19%	19%	18%	30%	13.6%	13.1%	12.7%
NATIONAL STEEL CORP-CL B	4.9%	5.1%	3.8%	8.9%	8.2%	12.8%	14%	13%	17%	30%	9.7%	9.3%	11.6%
ZAP	4.9%	5.0%	3.8%	14.3%	2.6%	3.5%	19%	8%	7%	30%	13.4%	5.3%	5.1%
SOFTLOCK.COM INC	5.3%	5.2%	3.8%	12.7%	14.8%	8.0%	18%	20%	12%	30%	12.6%	14.0%	8.3%
HERBORIUM GROUP INC	4.7%	4.2%	5.1%	4.1%	6.7%	4.6%	9%	11%	10%	30%	6.1%	7.6%	6.8%
COMPOSITE TECHNOLOGY CORPORA	4.7%	4.2%	5.1%	5.7%	5.2%	11.1%	10%	9%	16%	30%	7.2%	6.6%	11.4%
INTELLIGENT COMMUNICATION EN	5.4%	3.9%	3.8%	6.1%	9.7%	5.3%	11%	14%	9%	30%	8.0%	9.6%	6.4%
EPICUS COMMUNICATIONS GROUP	4.3%	4.0%	4.6%	7.8%	8.5%	6.5%	12%	12%	11%	30%	8.5%	8.7%	7.7%
AIR INDUSTRIES GROUP INC	4.3%	4.1%	4.6%	11.0%	12.5%	8.0%	15%	17%	13%	30%	10.7%	11.6%	8.8%
NEWTON ENERGY CORP	4.3%	4.1%	4.6%	6.5%	7.0%	5.5%	11%	11%	10%	30%	7.6%	7.7%	7.0%
MEDIA 100 INC	3.8%	3.7%	4.5%	10.0%	9.0%	8.4%	14%	13%	13%	30%	9.7%	8.9%	9.0%
INTL THOROUGHBRED BREEDERS	4.4%	4.4%	4.0%	12.9%	24.0%	16.8%	17%	28%	21%	30%	12.1%	19.9%	14.5%
MEDICAL STAFFING SOLUTIONS I	4.4%	4.7%	4.0%	23.4%	13.7%	5.4%	28%	18%	9%	30%	19.5%	12.8%	6.6%
U.S. ENERGY SYSTEMS INC	4.5%	4.5%	3.9%	12.1%	8.9%	22.5%	17%	13%	26%	30%	11.6%	9.4%	18.5%
PILGRIM'S PRIDE CORP	4.0%	2.7%	3.8%	7.5%	7.8%	33.6%	12%	11%	37%	30%	8.1%	7.4%	26.2%
GBO INC	3.5%	4.8%	3.9%	11.2%	9.4%	4.6%	15%	14%	8%	30%	10.3%	10.0%	5.9%
PROLOGIC MANAGEMENT SYSTEMS	3.7%	4.1%	4.4%	7.7%	4.8%	3.0%	11%	9%	7%	30%	8.0%	6.3%	5.1%
FACTORY 2-U STORES INC	4.0%	4.0%	4.1%	4.1%	3.8%	4.3%	8%	8%	8%	30%	5.7%	5.5%	5.9%
SIRICOMM INC	4.7%	4.2%	2.2%	8.9%	41.2%	35.7%	14%	45%	38%	30%	9.5%	31.8%	26.5%
CHESAPEAKE CORP	4.0%	2.1%	3.8%	9.0%	8.8%	12.7%	13%	11%	17%	30%	9.1%	7.7%	11.6%
TELEMETRIX INC	4.0%	2.3%	3.8%	13.2%	14.7%	32.1%	17%	17%	36%	30%	12.1%	11.9%	25.2%
PFF BANCORP INC	4.0%	2.7%	3.8%	11.0%	12.5%	8.0%	15%	15%	12%	30%	10.5%	10.6%	8.3%
INTROGEN THERAPEUTICS INC	4.0%	2.7%	3.8%	8.0%	8.4%	12.9%	12%	11%	17%	30%	8.4%	7.7%	11.7%
BUTLER INTL INC	4.0%	3.7%	2.9%	10.2%	10.2%	10.7%	14%	14%	14%	30%	9.9%	9.7%	9.5%
MOTORS LIQUIDATION CO	4.0%	3.7%	2.9%	6.7%	9.0%	18.0%	11%	13%	21%	30%	7.5%	8.9%	14.6%
VISTEON CORP	4.1%	3.6%	3.3%	8.0%	8.1%	1.2%	12%	12%	5%	30%	8.5%	8.2%	3.2%
CAPITAL CORP OF THE WEST	4.1%	3.2%	3.3%	6.5%	7.0%	7.5%	11%	10%	11%	30%	7.4%	7.1%	7.6%
CIB MARINE BANCSHARES INC	3.8%	3.5%	2.5%	5.5%	6.0%	6.5%	9%	9%	9%	30%	6.5%	6.6%	6.3%
WALKING CO HOLDINGS INC/THE	2.2%	3.4%	2.7%	6.6%	6.6%	9.2%	9%	10%	12%	30%	6.2%	7.1%	8.3%
COOPER-STANDARD HOLDING	2.2%	3.4%	2.7%	7.1%	7.3%	12.7%	9%	11%	15%	30%	6.5%	7.5%	10.8%
LUNA INNOVATIONS INC	2.2%	3.4%	2.7%	5.6%	6.0%	8.1%	8%	9%	11%	30%	5.5%	6.6%	7.6%
MEDCOM USA	2.2%	3.4%	2.7%	12.7%	11.5%	4.5%	15%	15%	7%	30%	10.4%	10.5%	5.1%
ASYST TECHNOLOGIES INC	2.2%	3.4%	2.7%	5.0%	6.7%	6.7%	7%	10%	9%	30%	5.1%	7.1%	6.6%
ABITIBIBOWATER INC	2.2%	3.4%	2.7%	8.7%	12.5%	59.7%	11%	16%	62%	30%	7.6%	11.1%	43.7%
GENERAL GROWTH PROPERTIES	2.2%	3.4%	2.7%	5.6%	5.6%	5.6%	8%	9%	8%	30%	5.5%	6.3%	5.8%
HOWARD HUGHES CORP/THE	2.2%	3.4%	2.7%	1.5%	2.3%	1.9%	4%	6%	5%	30%	2.6%	4.0%	3.2%
Average	**4.2%**	**4.0%**	**3.8%**	**8.8%**	**9.3%**	**11.7%**	**13.0%**	**13.3%**	**15.4%**		**9.1%**	**9.3%**	**10.8%**

Source: Author

Our COD_{FY-1} comes in at 9.1%, 9.3% for the COD_{FY}, and 10.8% for the COD_{FY1}. The COD at the filing day is only slightly above from COD_{FY-1} implying the latter already captures most of the looming distress ahead of the companies and the likelihood of the restructuring. It strikes us also the levels of the COE_{FY1} after the restructuring standing well above COD_{FY-1} and COD_{FY}. Despite the lower gearing of the companies in FY1 on average, the interest spread is 11.7%, well above the 9.3% in FY implying the high financing cost that the restructuring brings about for these companies.[56]

3.2.2 Cost of debt under Approach 2

Here, we look at the COD given the credit metrics at each point in time.

[56] This is common in Chapter 11. Debt-holders endure a significant "haircut" on their securities to bring down leverage but they are compensated through higher interests in the new restructured debt.

	COST OF DEBT (COD)												
	RFA			Spread			COD			Tax Rate	Post Tax COD		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1		FY-1	FY	FY1
SMC VENTURES INC	5.1%	5.0%	3.8%	5.5%	16.0%	5.5%	10.6%	21.0%	9.3%	30%	7.4%	14.7%	6.5%
CYTOMEDIX INC	5.7%	5.2%	4.1%	16.0%	16.0%	3.5%	21.7%	21.2%	7.6%	30%	15.2%	14.8%	5.4%
USG CORP	6.0%	5.1%	4.8%	2.8%	5.5%	1.8%	8.8%	10.6%	6.6%	30%	6.2%	7.4%	4.6%
FRIEDE GOLDMAN HALTER INC	6.2%	5.3%	5.1%	7.0%	16.0%	16.0%	13.2%	21.3%	21.1%	30%	9.2%	14.9%	14.8%
PROTEONOMIX INC	6.4%	5.2%	4.9%	16.0%	16.0%	16.0%	22.4%	21.2%	20.9%	30%	15.7%	14.8%	14.6%
RADNET INC	3.6%	4.4%	4.1%	13.0%	16.0%	16.0%	16.6%	20.4%	20.1%	30%	11.6%	14.2%	14.1%
AMERICAN WAGERING INCORP	4.5%	4.2%	4.5%	5.5%	5.5%	10.0%	10.0%	9.7%	14.5%	30%	7.0%	6.8%	10.1%
AMERCO	4.8%	3.4%	4.6%	8.5%	16.0%	7.0%	13.3%	19.4%	11.6%	30%	9.3%	13.6%	8.1%
WEIRTON STEEL CORP	5.0%	3.5%	4.7%	16.0%	16.0%	13.0%	21.0%	19.5%	17.7%	30%	14.7%	13.6%	12.4%
RAHAXI INC	5.0%	4.2%	4.1%	16.0%	16.0%	16.0%	21.0%	20.2%	20.1%	30%	14.7%	14.1%	14.1%
PRESIDENT CASINOS INC	5.4%	4.8%	3.5%	16.0%	16.0%	4.3%	21.4%	20.8%	7.8%	30%	15.0%	14.6%	5.5%
NATIONAL STEEL CORP-CL B	4.9%	5.1%	3.8%	16.0%	16.0%	4.1%	20.9%	21.1%	7.9%	30%	14.6%	14.7%	5.5%
ZAP	4.9%	5.0%	3.8%	16.0%	16.0%	16.0%	20.9%	21.0%	19.8%	30%	14.6%	14.7%	13.9%
SOFTLOCK.COM INC	5.3%	5.2%	3.8%	16.0%	16.0%	4.1%	21.3%	21.2%	7.9%	30%	14.9%	14.8%	5.6%
HERBORIUM GROUP INC	4.7%	4.2%	5.1%	16.0%	16.0%	4.1%	20.7%	20.2%	9.2%	30%	14.5%	14.1%	6.5%
COMPOSITE TECHNOLOGY CORPORA	4.7%	4.2%	5.1%	16.0%	16.0%	16.0%	20.7%	20.2%	21.1%	30%	14.5%	14.1%	14.8%
INTELLIGENT COMMUNICATION EN	5.4%	3.9%	3.8%	16.0%	16.0%	16.0%	21.4%	19.9%	19.8%	30%	15.0%	13.9%	13.9%
EPICUS COMMUNICATIONS GROUP	4.3%	4.0%	4.6%	16.0%	16.0%	16.0%	20.3%	20.0%	20.6%	30%	14.2%	14.0%	14.4%
AIR INDUSTRIES GROUP INC	4.3%	4.1%	4.6%	4.1%	16.0%	16.0%	8.4%	20.1%	20.6%	30%	5.9%	14.0%	14.4%
NEWTON ENERGY CORP	4.3%	4.1%	4.6%	16.0%	16.0%	16.0%	20.3%	20.1%	20.6%	30%	14.2%	14.0%	14.4%
MEDIA 100 INC	3.8%	3.7%	4.5%	16.0%	16.0%	16.0%	19.8%	19.7%	20.5%	30%	13.9%	13.8%	14.3%
INTL THOROUGHBRED BREEDERS	4.4%	4.4%	4.0%	16.0%	16.0%	16.0%	20.4%	20.4%	20.0%	30%	14.3%	14.3%	14.0%
MEDICAL STAFFING SOLUTIONS I	4.4%	4.7%	4.0%	3.5%	2.8%	4.3%	7.9%	7.5%	8.3%	30%	5.5%	5.2%	5.8%
U.S. ENERGY SYSTEMS INC	4.5%	4.5%	3.9%	16.0%	10.0%	16.0%	20.5%	14.5%	19.9%	30%	14.3%	10.2%	14.0%
PILGRIM'S PRIDE CORP	4.0%	2.7%	3.8%	2.8%	9.0%	1.0%	6.8%	11.7%	4.8%	30%	4.8%	8.2%	3.4%
GBO INC	3.5%	4.8%	3.9%	16.0%	11.0%	16.0%	19.5%	15.8%	19.9%	30%	13.7%	11.1%	13.9%
PROLOGIC MANAGEMENT SYSTEMS	3.7%	4.1%	4.4%	16.0%	16.0%	16.0%	19.7%	20.1%	20.4%	30%	13.8%	14.1%	14.3%
FACTORY 2-U STORES INC	4.0%	4.0%	4.1%	16.0%	16.0%	16.0%	20.0%	20.0%	20.1%	30%	14.0%	14.0%	14.1%
SIRICOMM INC	4.7%	4.2%	2.2%	16.0%	16.0%	16.0%	20.7%	20.2%	18.2%	30%	14.5%	14.1%	12.8%
CHESAPEAKE CORP	4.0%	2.1%	3.8%	5.5%	16.0%	5.5%	9.5%	18.1%	9.3%	30%	6.7%	12.7%	6.5%
TELEMETRIX INC	4.0%	2.3%	3.8%	16.0%	16.0%	5.5%	20.0%	18.3%	9.3%	30%	14.0%	12.8%	6.5%
PFF BANCORP INC	4.0%	2.7%	3.8%	16.0%	16.0%	16.0%	20.0%	18.7%	19.8%	30%	14.0%	13.1%	13.9%
INTROGEN THERAPEUTICS INC	4.0%	2.7%	3.8%	16.0%	16.0%	16.0%	20.0%	18.7%	19.8%	30%	14.0%	13.1%	13.9%
BUTLER INTL INC	4.0%	3.7%	2.9%	13.0%	16.0%	15.0%	17.0%	19.7%	17.9%	30%	11.9%	13.8%	12.6%
MOTORS LIQUIDATION CO	4.0%	3.7%	2.9%	3.5%	5.5%	13.0%	7.5%	9.2%	15.9%	30%	5.2%	6.4%	11.2%
VISTEON CORP	4.1%	3.6%	3.3%	3.5%	12.0%	4.1%	7.6%	15.6%	7.4%	30%	5.3%	10.9%	5.2%
CAPITAL CORP OF THE WEST	4.1%	3.2%	3.3%	0.0%	0.0%	0.0%	4.1%	3.2%	3.3%	30%	2.8%	2.2%	2.3%
CIB MARINE BANCSHARES INC	3.8%	3.5%	2.5%	0.0%	0.0%	0.0%	3.8%	3.5%	2.5%	30%	2.7%	2.4%	1.8%
WALKING CO HOLDINGS INC/THE	2.2%	3.4%	2.7%	14.0%	16.0%	8.5%	16.2%	19.4%	11.2%	30%	11.4%	13.6%	7.8%
COOPER-STANDARD HOLDING	2.2%	3.4%	2.7%	14.0%	16.0%	4.0%	16.2%	19.4%	6.7%	30%	11.4%	13.6%	4.7%
LUNA INNOVATIONS INC	2.2%	3.4%	2.7%	16.0%	16.0%	16.0%	18.2%	19.4%	18.7%	30%	12.8%	13.6%	13.1%
MEDCOM USA	2.2%	3.4%	2.7%	4.3%	4.3%	3.5%	6.5%	7.7%	6.2%	30%	4.6%	5.4%	4.3%
ASYST TECHNOLOGIES INC	2.2%	3.4%	2.7%	16.0%	11.0%	13.0%	18.2%	14.4%	15.7%	30%	12.8%	10.1%	11.0%
ABITIBIBOWATER INC	2.2%	3.4%	2.7%	16.0%	16.0%	16.0%	18.2%	19.4%	18.7%	30%	12.8%	13.6%	13.1%
GENERAL GROWTH PROPERTIES	2.2%	3.4%	2.7%	16.0%	16.0%	16.0%	18.2%	19.4%	18.7%	30%	12.8%	13.6%	13.1%
HOWARD HUGHES CORP/THE	2.2%	3.4%	2.7%	16.0%	16.0%	16.0%	18.2%	19.4%	18.7%	30%	12.8%	13.6%	13.1%
Average	**4.2%**	**4.0%**	**3.8%**	**12.1%**	**13.5%**	**10.9%**	**16.3%**	**17.4%**	**14.7%**		**11.4%**	**12.2%**	**10.3%**

Source: Author

Our COD_{FY-1} comes in at 11.4%, 12.2% for the COD_{FY}, and 10.3% for the COD_{FY1}.First remark we should make is that the COD_{FY} is higher than COD_{FY-1} underlining the sharp deterioration of the credit metrics of the companies that finally led to the restructuring. Our COD_{FY1} comes in at 10.3% down from 12.2% as of FY which is still a high level for a restructured company with an average interest spread of 10.9%.

In the table below we can see the difference in COD between approach 1 and 2. The difference is positively skewed to approach 1 in both FY-1 and FY suggesting that the debt market is pricing in a lower COD than what fundamentals reveal as the company head towards a restructuring process, underpinning the "Chapter 11 efficiency" thesis[57]. It seems that the market is already anticipating a "next door" restructuring and the market COD deviates from its fundamental value which is given by the synthetic COD. Only 51bps on average separate the COD under both approaches between FY and FY1 suggesting that the COD is fairly priced and investors seem to be comfortable with the debt risk level.

[57] As if the P&L based COD (which is the effective COD at the time) already anticipates an upcoming corporate restructuring.

Name	FY-1	FY	FY1
SMC VENTURES INC	511 bps	(609 bps)	399 bps
CYTOMEDIX INC	(734 bps)	(734 bps)	455 bps
USG CORP	323 bps	114 bps	621 bps
FRIEDE GOLDMAN HALTER INC	267 bps	(273 bps)	(137 bps)
PROTEONOMIX INC	(459 bps)	(763 bps)	(411 bps)
RADNET INC	(281 bps)	(385 bps)	(436 bps)
AMERICAN WAGERING INCORP	405 bps	213 bps	(211 bps)
AMERCO	(55 bps)	(485 bps)	130 bps
WEIRTON STEEL CORP	(380 bps)	(803 bps)	(251 bps)
RAHAXI INC	(954 bps)	(896 bps)	(224 bps)
PRESIDENT CASINOS INC	(140 bps)	(150 bps)	726 bps
NATIONAL STEEL CORP-CL B	(496 bps)	(544 bps)	611 bps
ZAP	(120 bps)	(939 bps)	(876 bps)
SOFTLOCK.COM INC	(234 bps)	(87 bps)	273 bps
HERBORIUM GROUP INC	(832 bps)	(654 bps)	33 bps
COMPOSITE TECHNOLOGY CORPORA	(722 bps)	(756 bps)	(340 bps)
INTELLIGENT COMMUNICATION EN	(694 bps)	(438 bps)	(747 bps)
EPICUS COMMUNICATIONS GROUP	(574 bps)	(525 bps)	(665 bps)
AIR INDUSTRIES GROUP INC	483 bps	(245 bps)	(560 bps)
NEWTON ENERGY CORP	(665 bps)	(630 bps)	(735 bps)
MEDIA 100 INC	(420 bps)	(490 bps)	(532 bps)
INTL THOROUGHBRED BREEDERS	(215 bps)	562 bps	53 bps
MEDICAL STAFFING SOLUTIONS I	1,396 bps	762 bps	77 bps
U.S. ENERGY SYSTEMS INC	(274 bps)	(76 bps)	457 bps
PILGRIM'S PRIDE CORP	329 bps	(84 bps)	2,280 bps
GBO INC	(336 bps)	(111 bps)	(800 bps)
PROLOGIC MANAGEMENT SYSTEMS	(579 bps)	(781 bps)	(912 bps)
FACTORY 2-U STORES INC	(832 bps)	(853 bps)	(820 bps)
SIRICOMM INC	(498 bps)	1,764 bps	1,376 bps
CHESAPEAKE CORP	245 bps	(502 bps)	506 bps
TELEMETRIX INC	(194 bps)	(92 bps)	1,862 bps
PFF BANCORP INC	(350 bps)	(245 bps)	(560 bps)
INTROGEN THERAPEUTICS INC	(559 bps)	(535 bps)	(215 bps)
BUTLER INTL INC	(193 bps)	(403 bps)	(301 bps)
MOTORS LIQUIDATION CO	222 bps	248 bps	347 bps
VISTEON CORP	316 bps	(273 bps)	(200 bps)
CAPITAL CORP OF THE WEST	455 bps	490 bps	525 bps
CIB MARINE BANCSHARES INC	385 bps	420 bps	455 bps
WALKING CO HOLDINGS INC/THE	(515 bps)	(655 bps)	47 bps
COOPER-STANDARD HOLDING	(482 bps)	(607 bps)	608 bps
LUNA INNOVATIONS INC	(729 bps)	(699 bps)	(552 bps)
MEDCOM USA	589 bps	507 bps	73 bps
ASYST TECHNOLOGIES INC	(770 bps)	(303 bps)	(443 bps)
ABITIBIBOWATER INC	(514 bps)	(246 bps)	3,060 bps
GENERAL GROWTH PROPERTIES	(727 bps)	(730 bps)	(727 bps)
HOWARD HUGHES CORP/THE	(1,012 bps)	(959 bps)	(986 bps)
Average	(231 bps)	(293 bps)	51 bps

Source: Author

Below the credit scoring, blended rating and the spread attached to the rating for our American sample under the synthetic rating approach.

	Scoring			Blended rating			Spread		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
SMC VENTURES INC	5.8	7.0	6.7	B-	D	C	5.5%	16.0%	5.5%
CYTOMEDIX INC	7.0	7.0	4.2	D	D	BB+	16.0%	16.0%	3.5%
USG CORP	3.7	5.6	3.5	BBB-	B-	BBB+	2.8%	5.5%	1.8%
FRIEDE GOLDMAN HALTER INC	6.0	7.0	7.0	CCC+	D	D	7.0%	16.0%	16.0%
PROTEONOMIX INC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
RADNET INC	6.6	7.0	7.0	C+	D	D	13.0%	16.0%	16.0%
AMERICAN WAGERING INCORP	5.6	5.6	6.3	B-	B-	CC+	5.5%	5.5%	10.0%
AMERCO	6.1	7.0	6.0	CCC	D	CCC+	8.5%	16.0%	7.0%
WEIRTON STEEL CORP	7.0	7.0	6.6	D	D	C+	16.0%	16.0%	13.0%
RAHAXI INC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
PRESIDENT CASINOS INC	7.0	7.0	5.5	D	D	B+	16.0%	16.0%	4.3%
NATIONAL STEEL CORP-CL B	7.0	7.0	4.9	D	D	BB-	16.0%	16.0%	4.1%
ZAP	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
SOFTLOCK.COM INC	7.0	7.0	4.8	D	D	BB-	16.0%	16.0%	4.1%
HERBORIUM GROUP INC	7.0	7.0	4.8	D	D	BB-	16.0%	16.0%	4.1%
COMPOSITE TECHNOLOGY CORPORA	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
INTELLIGENT COMMUNICATION EN	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
EPICUS COMMUNICATIONS GROUP	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
AIR INDUSTRIES GROUP INC	5.0	7.0	7.0	BB-	D	D	4.1%	16.0%	16.0%
NEWTON ENERGY CORP	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
MEDIA 100 INC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
INTL THOROUGHBRED BREEDERS	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
MEDICAL STAFFING SOLUTIONS I	4.2	3.8	5.4	BB+	BBB-	B+	3.5%	2.8%	4.3%
U.S. ENERGY SYSTEMS INC	7.0	6.4	7.0	D	CC+	D	16.0%	10.0%	16.0%
PILGRIM'S PRIDE CORP	3.7	6.2	2.1	BBB-	CCC-	A+	2.8%	9.0%	1.0%
GBO INC	7.0	6.5	7.0	D	CC	D	16.0%	11.0%	16.0%
PROLOGIC MANAGEMENT SYSTEMS	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
FACTORY 2-U STORES INC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
SIRICOMM INC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
CHESAPEAKE CORP	5.8	7.0	5.8	B-	D	B-	5.5%	16.0%	5.5%
TELEMETRIX INC	7.0	7.0	5.8	D	D	B-	16.0%	16.0%	5.5%
PFF BANCORP INC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
INTROGEN THERAPEUTICS INC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
BUTLER INTL INC	6.6	7.0	6.9	C+	D	C-	13.0%	16.0%	15.0%
MOTORS LIQUIDATION CO	4.3	5.8	5.4	BB+	B-	B+	3.5%	5.5%	13.0%
VISTEON CORP	4.1	6.6	4.8	BB+	CC-	BB-	3.5%	12.0%	4.1%
CAPITAL CORP OF THE WEST									
CIB MARINE BANCSHARES INC									
WALKING CO HOLDINGS INC/THE	6.8	7.0	6.2	C	D	CCC	14.0%	16.0%	8.5%
COOPER-STANDARD HOLDING	6.8	7.0	4.5	C	D	BB	14.0%	16.0%	4.0%
LUNA INNOVATIONS INC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
MEDCOM USA	5.0	5.4	4.5	B+	B+	BB+	4.3%	4.3%	3.5%
ASYST TECHNOLOGIES INC	7.0	6.5	6.6	D	CC	C+	16.0%	11.0%	13.0%
ABITIBIBOWATER INC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
GENERAL GROWTH PROPERTIES	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
HOWARD HUGHES CORP/THE	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
Average	**6.4**	**6.7**	**6.2**				**12.7%**	**14.1%**	**11.4%**

Source: Author

In the table above we can observe the weakness of the credit scoring of the companies in FY-1 and FY as expected which bodes perfectly with a D/CCC rating given their poor credit metrics. The average spread in FY rises to 14.1% from 12.7% in FY-1 under our synthetic rating framework but the fundamentals remain unchanged as credit scoring suggests (6.4 in FY-1 and 6.7 in FY). In FY1 the credit scoring significantly improves, both in terms of leverage and profitability as indicated in our fundamental review of the American sample bringing the scoring down to 6.2 which commensurate well for a B- rating. The spread in FY1 comes out at 11.4%, a very high level for a newly restructured company. The improvement in the capital structure and the drop in leverage is partially offset by the very weak financial and operating metrics of these companies (albeit better than their European counterparts) leaving the spread cumbersomely at 11.4%

Please refer to appendix for a full detail of the credit metrics per company.

3.3 Capital Structure weighting

For the capital structure weighting (Debt and Equity to Capital) we use the same rationale as for the European universe.

	FY-1	FY	FY1
Debt			
Book value	84,614	97,098	60,274
% change		15%	-38%
Market value	55,205	55,927	60,274
% change		1%	8%
% of book value	65%	58%	100%
Equity			
Book value	32,420	14,745	28,801
% change		-55%	95%
Market value	25,227	5,436	18,543
% change		-78%	241%
% of book value	78%	37%	64%
D/E			
Book value	2.6x	6.6x	2.1x
Market value	2.2x	10.3x	3.3x

Source: Author

We see a fall in gross debt by 38% and an increase of equity by 95% between FY and FY1 suggesting the important liability management carried out to shore up the capital structure. D/E falls to 2.1x in FY1 from the highs of 6.6x in FY. As a consequence, the market based D/E, which happens to be our weighting for the WACC, falls from 10.3x in FY to 3.3x in FY1. This suggests two ideas when comparing the American versus the European samples:

- The high gearing of the US corporates due to the lack of banking financing and a proliferating bond market with a high leverage tolerance to pursue high yields.
- The huge liability management efforts through the American restructurings to prop up the capital structure of the firms.

3.4 WACC

Below a table with the outcome of the WACC for the American sample.

	FY-1 WACC				FY WACC				FY1 WACC			
Name	Equity %	Debt %	WACC (P&L)	WACC (Synt)	Equity %	Debt %	WACC (P&L)	WACC (Synt)	Equity %	Debt %	WACC (P&L)	WACC (Synt)
SMC VENTURES INC	97%	3%	6.77%	6.59%	80%	20%	6.74%	6.84%	81%	19%	6.14%	6.56%
CYTOMEDIX INC	100%	0%	8.53%	8.54%	66%	34%	8.10%	8.54%	86%	14%	10.98%	8.52%
USG CORP	76%	24%	8.55%	7.76%	23%	77%	9.21%	8.07%	41%	59%	10.41%	7.38%
FRIEDE GOLDMAN HALTER INC	59%	41%	8.79%	7.70%	6%	94%	12.15%	10.01%	4%	96%	13.32%	9.95%
PROTEONOMIX INC	70%	30%	8.54%	9.92%	37%	63%	8.04%	9.66%	49%	51%	10.44%	9.60%
RADNET INC	23%	77%	7.95%	10.11%	8%	92%	10.11%	12.13%	9%	91%	9.77%	12.01%
AMERICAN WAGERING INCORP	68%	32%	13.69%	12.39%	52%	48%	11.63%	12.32%	57%	43%	10.28%	13.41%
AMERCO	26%	74%	8.77%	9.18%	9%	91%	8.74%	12.32%	37%	63%	12.64%	8.29%
WEIRTON STEEL CORP	20%	80%	10.09%	13.11%	1%	99%	5.62%	12.24%	0%	100%	9.85%	11.22%
RAHAXI INC	92%	8%	11.03%	11.79%	92%	8%	11.51%	11.74%	99%	1%	9.41%	11.74%
PRESIDENT CASINOS INC	5%	95%	13.52%	14.85%	6%	94%	13.10%	14.44%	7%	93%	12.42%	5.80%
NATIONAL STEEL CORP-CL B	11%	89%	10.04%	14.44%	4%	96%	9.27%	14.53%	1%	99%	11.61%	6.36%
ZAP	99%	1%	11.34%	11.35%	53%	47%	9.09%	11.35%	74%	26%	8.81%	11.34%
SOFTLOCK.COM INC	98%	2%	15.84%	15.88%	36%	64%	14.77%	15.87%	1%	99%	8.34%	15.72%
HERBORIUM GROUP INC	13%	87%	7.60%	14.86%	22%	78%	9.73%	14.59%	8%	92%	7.38%	7.87%
COMPOSITE TECHNOLOGY CORPORA	100%	0%	11.50%	15.30%	99%	1%	11.03%	15.30%	95%	5%	11.88%	15.30%
INTELLIGENT COMMUNICATION EN	87%	13%	13.54%	14.45%	33%	67%	11.49%	14.32%	82%	18%	6.07%	14.31%
EPICUS COMMUNICATIONS GROUP	82%	18%	20.66%	21.68%	17%	83%	11.96%	21.64%	20%	80%	9.17%	21.71%
AIR INDUSTRIES GROUP INC	97%	3%	13.21%	13.04%	85%	15%	14.10%	13.32%	3%	97%	8.83%	13.33%
NEWTON ENERGY CORP	43%	57%	11.42%	15.23%	56%	44%	13.39%	15.13%	14%	86%	7.66%	15.33%
MEDIA 100 INC	53%	47%	7.26%	9.23%	3%	97%	9.02%	9.20%	0%	100%	9.02%	9.45%
INTL THOROUGHBRED BREEDERS	55%	45%	17.39%	18.37%	74%	26%	22.71%	18.38%	0%	100%	14.55%	18.25%
MEDICAL STAFFING SOLUTIONS I	98%	2%	11.31%	11.04%	50%	50%	13.50%	11.03%	3%	97%	6.72%	11.04%
U.S. ENERGY SYSTEMS INC	33%	67%	10.75%	12.60%	31%	69%	9.52%	9.78%	4%	96%	18.23%	12.34%
PILGRIM'S PRIDE CORP	84%	16%	7.02%	6.50%	11%	89%	7.09%	7.04%	79%	21%	12.25%	6.28%
GBO INC	71%	29%	8.43%	9.40%	32%	68%	10.10%	8.65%	58%	42%	7.51%	9.49%
PROLOGIC MANAGEMENT SYSTEMS	18%	82%	7.80%	12.53%	6%	94%	6.44%	12.79%	11%	89%	5.60%	12.92%
FACTORY 2-U STORES INC	77%	23%	11.26%	13.20%	45%	55%	9.55%	13.21%	0%	100%	5.92%	13.23%
SIRICOMM INC	100%	0%	12.10%	16.58%	-54%	154%	41.76%	16.58%	10%	90%	24.29%	16.58%
CHESAPEAKE CORP	24%	76%	9.56%	7.70%	0%	100%	7.68%	12.26%	0%	100%	11.60%	7.60%
TELEMETRIX INC	23%	77%	12.65%	14.15%	6%	94%	11.94%	13.19%	26%	74%	21.78%	8.36%
PFF BANCORP INC	42%	58%	11.26%	13.30%	0%	100%	10.64%	12.76%	0%	100%	8.29%	13.23%
INTROGEN THERAPEUTICS INC	96%	4%	8.89%	9.09%	70%	30%	10.60%	9.05%	7%	93%	12.12%	9.08%
BUTLER INTL INC	21%	79%	9.19%	10.72%	2%	98%	9.71%	12.22%	0%	100%	9.54%	11.26%
MOTORS LIQUIDATION CO	20%	80%	8.79%	7.00%	2%	98%	9.03%	7.96%	1%	99%	14.59%	11.76%
VISTEON CORP	22%	78%	9.34%	6.87%	1%	99%	8.25%	11.27%	9%	91%	4.08%	6.77%
CAPITAL CORP OF THE WEST	18%	82%	6.85%	3.10%	0%	100%	7.13%	2.58%	0%	100%	7.55%	2.65%
CIB MARINE BANCSHARES INC	6%	94%	6.77%	3.16%	1%	99%	6.66%	2.92%	12%	88%	6.49%	2.30%
WALKING CO HOLDINGS INC/THE	32%	68%	6.77%	10.26%	6%	94%	7.20%	11.79%	20%	80%	7.97%	7.87%
COOPER-STANDARD HOLDING	50%	50%	7.87%	10.29%	20%	80%	8.25%	11.42%	55%	45%	8.68%	6.94%
LUNA INNOVATIONS INC	87%	13%	7.55%	8.52%	45%	55%	5.55%	8.63%	80%	20%	5.51%	8.56%
MEDCOM USA	97%	3%	6.64%	6.46%	83%	17%	12.19%	6.48%	93%	7%	4.98%	6.45%
ASYST TECHNOLOGIES INC	61%	39%	6.32%	9.33%	13%	87%	9.57%	8.30%	0%	100%	6.57%	8.64%
ABITIBIBOWATER INC	17%	83%	8.93%	13.22%	1%	99%	11.18%	13.93%	1%	99%	43.38%	13.50%
GENERAL GROWTH PROPERTIES	34%	66%	7.95%	12.78%	1%	99%	6.76%	13.34%	17%	83%	7.25%	12.99%
HOWARD HUGHES CORP/THE	90%	10%	10.29%	11.33%	90%	10%	11.78%	11.42%	86%	14%	7.55%	11.36%
Average			**10.0%**	**11.2%**			**10.7%**	**11.5%**			**10.6%**	**10.5%**

Source: Author

The outcome is as follows:

- Approach 1 (P&L based WACC)
  - $WACC_{FY-1}$: 10.0%
  - $WACC_{FY}$: 10.7%
  - $WACC_{FY1}$: 10.6%

- Approach 2 (Synthetic rating based WACC)
  - WACCFY-1 : 11.2%
  - WACCFY : 11.5%
  - WACCFY1 : 10.5%

Under Approach 1, WACC does not change significantly through the distress period remaining below 11% throughout. This can be partially explained by the market belief in the restructuring process ex and post. The fact that the WACC only changes by 100bps between FY and FY1 implies the comfort that

Chapter 11 conveys to investors that seek the rehabilitation of the company and enhances the recovery value of their investments.

Under approach 2, the drop in WACC between FY and FY1 is more obvious given the sharp improvement in the financial leverage and in the fundamentals of the companies. It is also worth mentioning that the $WACC_{FY1}$ under both methods comes out at 10.5% suggesting the ability of the market to correctly price in the WACC the operating and financial improvements in the companies. This fact supports even more the "Chapter 11 efficiency thesis" that we have theoretically discussed in section 1 and empirically tested in this section. We will dwell on the absolute and relative values of the WACC at the end of this section.

3.4.1 WACC sensitivity: the ERP as a key driver

As carried out for the European sample, we evaluate the WACC levels under different ERP assumptions. The absolute level of WACC shifts up and down by 400bps-600bps according to the level of ERP underscoring the importance of fairly estimating the right level of premium to avoid overpricing or underpricing the cost of equity.

FY-1 WACC				FY WACC				FY1 WACC			
US ERP		US ERP		US ERP		US ERP		US ERP		US ERP	
2%	7.9%	2%	8.8%	2%	9.2%	2%	9.2%	2%	9.7%	2%	8.2%
3%	8.6%	3%	9.6%	3%	9.7%	3%	10.0%	3%	10.0%	3%	9.0%
4%	**9.3%**	4%	**10.4%**	4%	**10.2%**	4%	**10.7%**	4%	**10.3%**	4%	**9.8%**
5%	**10.0%**	5%	**11.2%**	5%	**10.7%**	5%	**11.5%**	5%	**10.6%**	5%	**10.5%**
6%	10.7%	6%	12.0%	6%	11.2%	6%	12.3%	6%	10.9%	6%	11.3%
7%	11.4%	7%	12.8%	7%	11.7%	7%	13.1%	7%	11.2%	7%	12.1%

Source: Author

4 Recovery rates: US vs Europe

Before venturing into the WACC comparison analysis we would like to briefly comment on the debt recovery rates in US and Europe. We can observe that the recovery rate for the debt across the board (senior and junior) is higher in US than in Europe despite being the bond market (US) more dispersed and difficult to coordinate versus the bank debt (Europe)[58]. However, the powerful tools of Chapter 11 as discussed in section 1 plus the long track record of restructuring (as opposed to liquidation in Europe) help boosting the recovery rates of the debt-holders.

ISSUER-WEIGHTED RECOVERY RATES FOR EUROEAN AND NORTH AMERICAN ISSUERS

	Europe			US		
	2006	2005	1982-2006	2006	2005	1982-2006
Sr Secured Bonds	39.6%	na	44.5%	86.3%	71.9%	53.8%
Sr. Unsecured Bonds	58.4%	na	27.0%	54.3%	55.4%	38.0%
Sr. Subordinated Bonds	na	na	33.5%	43.6%	31.0%	32.5%
Subordinated Bonds	na	na	30.7%	56.1%	51.3%	31.2%
Bonds jr. Subordinated	na	na	na	na	na	23.9%

Source: Moody's (2007) and author

[58] This lack of coordination may cause an under-investment or over-investment problem as we have mentioned before.

There is a stark difference between the recovery rate for the Senior Secured and Unsecured bondholders between Europe and US by about 20% while the latter maintaining a 30% or above recovery rate for the junior tranches.

Below a more recent evidence of the recovery rates in US vs Europe. US boasts a higher recovery rate (76.7 c/$ versus 62.9 c/$ in Europe), a lower time for its restructuring programs to complete (1.5 years vs 1.7 years in Europe)[59] and a lower cost (7% of estate versus 9.7% in Europe) of the restructuring.

Default values (2008)	Recovery rate (cents in $)	Average time to complete	Cost (% of estate)
France	44.7	1.9	9
Switzerland	46.8	3.0	4
Germany	52.2	1.4	8
Italy	56.6	1.8	22
Spain	73.2	1.0	15
US	76.7	1.5	7
Netherlands	82.7	1.1	4
UK	84.2	1.0	6
Western Europe	62.9	1.6	9.7
US	76.7	1.5	7.0
Difference	22%	-6%	-28%

Source: Economist (2007) and author

We are confident that all these evidences drive the mindset of the investors in US companies and they are probably factored in the cost of capital of the distressed companies as they make their way into the restructuring.

5 Relative WACC analysis US vs Europe

This section has a threefold mission: we seek to understand the absolute levels of the outcome. Secondly, we shed some light on the relative value of the WACC and its components between the American and the European sample. Lastly, we draw some conclusions by comparing the outcome of the empirical project with the theoretical underpinnings of the major restructuring regimes laid out in section 1.

We would like to make a quick remark on the European sample. Recall that the European sample is not entirely representative because of its small size, its skew to Germany[60] and the lack of more creditor friendly jurisdictions such as UK and Ireland. Its size is small enough to venture into drawing convincing conclusions but the reality is that most of the public companies that filed for restructuring were finally wound up or taken private; The German code is a more debtor friendly proceeding (mostly with the new legislation) relative to the rest of Western European codes with similarities to the US restructuring

[59] We have discussed in section 1 how the recovery rate for investors drops as the restructuring is delayed due to the lofty restructuring related fees (judges, trustees, lawyers, etc).

[60] A more debtor friendly jurisdiction from our view but still very investor friendly relative to US as it lacks efficient restructuring tools.

procedure. Hence, our sample is slightly biased to the German; lastly, the absence of some relevant legal jurisdictions such as UK or Italy in our sample coupled with the dominance of Germany in our list of companies prevents our two samples to be fairly compared.

Below the absolute levels of COE, COD and WACC for both the European and the American samples.

	FY-1	FY	FY1
EUROPE			
Cost of debt (Average)	13.3%	14.1%	12.1%
P&L COD	12.9%	14.7%	13.6%
Synthetic COD	13.7%	13.4%	10.5%
Cost of equity	10.0%	13.1%	10.5%
WACC (Average)	10.8%	11.7%	11.6%
P&L WACC	10.4%	12.4%	12.8%
Synthetic WACC	11.2%	10.9%	10.3%
US			
Cost of debt (Average)	10.3%	10.8%	10.6%
P&L COD	9.1%	9.3%	10.8%
Synthetic COD	11.4%	12.2%	10.3%
Cost of equity	11.0%	13.4%	10.5%
WACC (Average)	10.6%	11.1%	10.6%
P&L WACC	10.0%	10.7%	10.6%
Synthetic WACC	11.2%	11.5%	10.5%

Source: Author

We conduct our analysis by commenting first on the absolute and relative values of the WACC components that will help us to explain the purpose of this empirical project: distressed WACC between US and Europe. We lay out potential explanations of the outcome based on the results of the project and our thoughts on the merits and demerits of each regime. Needless to say, there could well be other reasons out of our reasoning[61] but this is our best approximation.

P&L COD

The US P&L COD is lower on absolute terms than that of Europe though the period. There could potential explanations for that:

- The better financial and credit metrics of the US firms relative to those of their European counterparts after the restructuring. Chapter 1 seeks to rehabilitate the company through powerful tools (debtor retains control, automatic stay, debtor's exclusive right to propose reorganization plan, non-unanimity rules for approving reorganization plan, cost rationalization to bolster the financials of the company, super senior financing etc) to guarantee a successful emersion form the restructuring process. The company is encouraged through the restructuring process to keep up with these tools by improving its financial and credit metrics.
- Despite the poor credit quality and liquidity of the US metrics in FY-1, COD is overall very low on absolute terms for a distressed company. This low level could be driven by the debt market perception of a looming restructuring (Chapter 11) which will help the company through a rehabilitation exercise boosting the company value and hence the recovery rate for the debtor

[61] The WACC of a company in our sample could be driven by the general decline of its industry, sovereign concerns etc.

investor base as a whole[62] (reinforcing the "Chapter 11 efficiency thesis"). In Europe, COD does not seem to capture that potential efficiency given the uptick in COD between FY-1 and FY implying a market concern on the restructuring. FY COD in US ticked up to 9.3% (from 9.1% in FY-1) but lower than the European FY COD that creeps up from 12.9% in FY-1 to 14.7% in FY. At first sight US investors seems to be more comfortable with the restructuring event than their European counterparts suggesting some confidence in the efficiency of the Chapter 11. Likewise, the recovery rate for the debt holder as a whole[63] has been traditionally much higher in US than in Europe shoring up the confidence of the debt investors in the Chapter 11.

- After the restructuring, COD in US goes up to 10.8% versus a drop to 13.6% in Europe, underlying the cost that US debtor investor bears after such a tedious liability management process. However, still the COD remains low versus Europe underscoring the confidence in the US restructuring process.

Synthetic COD

The US Synthetic COD is lower on absolute terms than that of Europe though the period. The same reasons apply here. US distressed companies have better credit and operating metrics both ex and post restructuring. The synthetic COD is a more fundamentally driven cost of debt (as opposed to the P&L one which is more book value based) and objectively picks the fair credit spread given the underlying credit metrics.

COE

US COE is higher than Europe's COE in FY-1 but similar in FY and FY1. It is clear than in Chapter 11 equity holders usually get severely impaired or severely diluted through equity-debt swaps or in some instances absolutely wiped out[64]. This is a consequence of thorough liability process management (see the drop in gross debt and the increase in book equity in 3.1.3). We can observe that by looking at the P/B multiples in the appendix where the equity trades at deep discounts to NAV. However, we are not very surprised by the absolute level of the US FY-1 COE given the low expected recovery of the equity holders in a distressed scenario[65].

It strikes us the low level of the European FY-1 COE[66] relative to the US one whose restructuring regimes are more creditor-friendly. Therefore we were expecting lower a FY-1 COE in the US than in Europe due to active role that equity holders play in the US restructuring process. FY COE soars in Europe and to a lesser extent in US implying concerns on the recovery of the equity holders in Europe. FY1 COE stabilizes afterwards in both Europe and US at 10.5%, the latter significantly down from FY. This could be

[62] In liquidation, junior debtors usually get very impaired. In Chapter 11, though also getting impaired (or fully impaired ie cramdown), they have a chance to negotiate better terms by getting actively involved in the process.

[63] Recall the deviation from the strict absolute rule that sees the recovery of supposedly impaired junior holders rising in an otherwise null recovery scenario pushing up the recovery rate of the debt-holders as a whole.

[64] However deviations from the absolute priority rule are common increasing their expected recovery.

[65] But still higher than a liquidation or in a creditor friendly style of restructuring where the equity holders are absolutely "sidelined" during the process. In Chapter 11 equity holders usually enjoy a say in the process and become active parts of it.

[66] Partially explained by the dominance of Germany in our sample with a more Chapter 11 style of restructuring.

due to a successful outcome for equity holders either through a positive liability management for them or through deviations from the strict absolute priority rule (DSAP). The DSAP refers to the fact that the "pie" is not share according to the SAP (Absolute Priority Rule) in the restructuring process. For instance in Chapter 11 the restructuring plan must be approved by all creditor classes and equity with each class requiring majority vote of creditors within each class and two thirds by value[67]. This could lead to a recovery for equity holders that would have never been possible under the SAP. Below we can see the deviations from absolute priority in US and UK expressed as a % of the face value of the claims over the last 10 years. Deviations have declined significantly in US because of changes to the bankruptcy code which are more creditor oriented.

Creditor Class	UK Workouts	Chapter 11	US Distressed Exchanges
Secured	-12.0%	-4.0%	-7.0%
Unsecured	6.0%	1.0%	-1.0%
Equity	6.0%	3.0%	8.0%

Source: Franks and Torous (1994), Olsen (1996) and the author

WACC

We finally get to our WACC comparison between both samples, our ultimate goal in our empirical model. Above we have put forward some potential explanations for the COD and COE levels on an absolute and relative basis. However, the WACC has to be evaluated on its own, regardless of the individual value of its main components. This is due to the fact that capital structure (D/E) powerfully drives the cost of capital, mostly on a mark to market basis. The market price of the capital structure dramatically changes the value of the WACC relative to the level derived by using book value. Therefore, it is the WACC itself which tells the "true" meaning of the changes experienced by the company.

On average, the distressed WACC is lower in US than in Europe across our three periods. What are the potential explanations for that? We walk through each period to come into terms with it.

FY-1 and FY

When the company's profitability rapidly erodes, free cash flows are weak for debt service and liquidity fades then the company enters a distressed face. The market and investors start to anticipate a potential restructuring or liquidation ahead of them if a workout is not feasible. Investors think in terms of recovery rate whereas the company (management) thinks in terms of survival and value protection. Then the bankruptcy code comes into play. The code affects in three ways: the pricing of debt and interest rate spreads; the management of the financial distress; how the pie is dividend among creditors, shareholders and the debtor. If the restructuring is inevitable and the liquidation is ruled out (as the company is worth more as a going concern) then the investors think in terms of the instruments that the restructuring code has to protect the value of the company. The table below is a quick summary of these instruments that the reader should have in mind to understand our reasoning:

[67] Recall that deviations from strict absolute priority always sum to zero.

	UK	France	Germany	US
Main bankruptcy procedure	Administrative Receivership	Redressment judiciaire	Insolvency Act	Chapter 11
Control rights	Secured creditors	Court appointed administrator	Creditors under court supervision	Debtor, creditors collectively under court supervision
Automatic stay	None	Yes (up to 20 months)	Possible (3 months)	180 days but unlimited period of renewal
Supra-priority financing	None	Yes	Only if creditors approve	Yes
Dilution of secured claims	None	High	Limited	Limited
Creditor's rights score (max=4)	4	0	3	1

Source: Franks (2008) and the author

It comes as no surprise that the recovery rate is higher in US than in Europe. It is the combination of:

- *Control rights* between the debtor and the creditors supervised by a court that facilitates the protection of the company's value (the company itself and indirectly its shareholders) and the creditor's interests.
- *Automatic stay*: aims at shielding the value of the company from the secured creditors that seeks to enforce their collateral. This instruments allows to protect the value of the company and hence the recovery rate of the unsecured and ultimately of the equity holders.
- *Supra-financing*: this instrument also helps the company through the restructuring process if the cash is needed to make a mandatory payment or invest in a newly positive NPV project. As it is always easier to raise money internally than externally in a distressed situation, this loan allows the company to carry on its operations without undermining the current and future business of the company. Likewise, it helps to protect the value of the company and hence the recovery rate of the entire investor base.
- *Dilution of secured claims*: we have seen the deviations from the strict absolute priority rule (DSAP). This is usually damaging for secured investors that witness value transfer from their claims to more junior lenders. In US given the relevance of the unsecured bond market within the capital structure of the companies, DSAP allows to enhance the recovery value of unsecured investors and potentially the equity holders.
- *Creditor's right score*: Chapter 11 would score low at first sight given its debtor oriented profile. However, all these value enhancing instruments of Chapter 11 translate into company's value protection that consequently increases the recovery rate of the entire investor base.

Therefore, the lower FY-1 and FY WACC level (in particular the P&L based WACC) in US versus Europe reinforces the "Chapter 11 efficiency thesis" that we highlighted in section 1, which is also supported by the higher historical recovery rate for investors in US distressed companies. When the restructuring is looming, investors in general feel more comfortable with a value enhancing legal framework with powerful protective instruments as opposed to more credit friendly jurisdictions that aim to just protect the interest of the secured creditors (the kind of market in Europe).

FY1

From our point of view the lower FY1 WACC in US is lower than in Europe for two reasons:

- The better credit and financial metrics of the newly restructured companies as we have seen previously. Chapter 11, as a debtor friendly code, aims not only to conduct a aggressive liability management to shore up the capital structure but forces the company to improve its profitability and cash flows to restore its business flow before exiting the restructuring process. Chapter 11 does not conceive a comprehensive restructuring without a solid improvement in fundamentals or otherwise the restructuring will never meet with success.
- The successful rate of the Chapter 11 emerging countries. Such a thorough and comprehensive code encompassing both lender concessions (debt forgiveness, debt for equity swaps, extension of maturity & expansion of new bank debt) and borrower concessions (sale of assets, new equity infusion, repayment of debt) boost the successful rate of companies emerging from Chapter 11. A newly sound capital structure with strong credit and financial metrics undoubtedly warrants a lower WACC.
    - Undoubtedly investors, regardless of their recovery rate[68], should feel more comfortable sitting in a newly rehabilitated company which has undergone a significant overhaul of the capital structure through very powerful and effective tools. All these tools aim to protect the value of the company: by avoiding collateral seizure (stay); by allowing cash flows streams and financing (super financing loans); by getting all investors involved in the process, etc.
    - Therefore the lower WACC in FY1 in US vs Europe is a combination of better fundamentals, better recovery rates for investors, and confidence in the restructuring by the market.

In summary, our theoretical preference (section 1) over Chapter 11 in terms of efficiency, comprehensiveness, and effectiveness **might**[69] be finally supported by the empirical results on the WACC. If Chapter 11 takes pride of its efficiency to successfully turn a distressed company around, will the WACC be able to capture that?

6 Limitations of our empirical analysis

There are several limitations in our analysis that we would like to discuss. These limitations stem from the size, the nature and the statistical dispersion of the sample; the lack of market data for some key inputs; and the input assumptions.

The sample

As we described at the beginning the section we have gone about the empirical analysis with a very small sample. This empirical project aims to estimate the market value of the WACC for distressed companies and thus, we need market data for publicly trading companies. Therefore, we leave out from the sample

[68] Which is also higher in US than in Europe.

[69] We highlight "might" as the outcome of the WACC is not as accurate as we would have liked, rendering the results "open to debate".

all private distressed companies or otherwise trading companies that went private after the restructuring, which limits the size of our sample.

Second, the profile of the sample is not ideal as we are putting together companies from different sectors with different market dynamics, balance sheets, financial and credit metrics and so on. As a consequence, we are not comparing “apples” to “apples” and the size or the losses of a company for example could severely drive the final output. Even though we have been very diligent through the filtering process of the sample to discard small companies or rather unreliable data, we still have a sample with stark disparities amongst the different firms. Since we are calculating averages for the sample, the output is affected by the weights of some companies within the sample.

Thirdly, and in line with the previous one, our two samples display significant dispersion, skewness and range as we can observe in the table below. This is the consequence of a having a small and heterogeneous sample.

Europe sample statistics

	FY-1		FY		FY1	
	WACC (P&L)	WACC (Synt)	WACC (P&L)	WACC (Synt)	WACC (P&L)	WACC (Synt)
Arithmetic mean	10.4%	11.2%	12.4%	10.9%	12.8%	10.3%
Geometric mean	9.8%	10.5%	11.4%	10.3%	10.7%	9.8%
Standard Deviation	3.7%	3.7%	4.7%	3.8%	9.0%	3.4%
Variance	0.1%	0.1%	0.2%	0.1%	0.8%	0.1%
Median	10.1%	10.6%	12.8%	10.2%	10.1%	9.8%
Max	19.4%	19.4%	23.1%	19.4%	38.0%	19.4%
Min	5.3%	5.4%	5.1%	5.4%	5.1%	5.1%
Range	14.1%	14.1%	17.9%	14.1%	32.8%	14.4%
Skewness	59.6%	29.4%	41.1%	35.5%	190.2%	58.8%
Kurtosis	-13.3%	-56.2%	27.8%	-69.0%	306.2%	68.4%
Quartile 1	7.2%	8.7%	8.7%	7.9%	7.4%	8.1%
Quartile 2	10.1%	10.6%	12.8%	10.2%	10.1%	9.8%
Quartile 3	13.1%	14.1%	14.8%	13.9%	13.2%	12.4%
Quartile 4	19.4%	19.4%	23.1%	19.4%	38.0%	19.4%

Source: Author

US sample statistics

	FY-1		FY		FY1	
	WACC (P&L)	WACC (Synt)	WACC (P&L)	WACC (Synt)	WACC (P&L)	WACC (Synt)
Arithmetic mean	10.0%	11.2%	10.7%	11.5%	10.6%	10.5%
Geometric mean	9.6%	10.5%	10.0%	10.8%	9.5%	9.7%
Standard Deviation	3.0%	3.8%	5.5%	3.6%	6.4%	3.9%
Variance	0.1%	0.1%	0.3%	0.1%	0.4%	0.2%
Median	9.1%	11.2%	9.6%	12.0%	9.1%	10.5%
Max	20.7%	21.7%	41.8%	21.6%	43.4%	21.7%
Min	6.3%	3.1%	5.5%	2.6%	4.1%	2.3%
Range	14.3%	18.6%	36.2%	19.1%	39.3%	19.4%
Skewness	143.7%	19.4%	422.0%	-5.7%	343.8%	38.2%
Kurtosis	269.1%	41.6%	2237.0%	111.4%	1547.5%	57.2%
Quartile 1	7.9%	8.7%	8.1%	9.1%	7.4%	7.9%
Quartile 2	9.1%	11.2%	9.6%	12.0%	9.1%	10.5%
Quartile 3	11.3%	13.3%	11.7%	13.3%	11.8%	13.2%
Quartile 4	20.7%	21.7%	41.8%	21.6%	43.4%	21.7%

Source: Author

Market data

If our goal is to estimate the market value of the WACC, by all means we need market data. This is even more relevant when we talk about distressed companies whose capital structure at market prices strongly deviates from their book value. However, it is a difficult and sometimes an impossible mission to get hold of market prices for the debt. Either there is no historical market data or otherwise it is not reliable. Furthermore, these firms hold plenty of bilateral or revolving credit loans in the balance sheets that never trade in the market so we have to estimate their market value. You can count on the book value but historical values are seldom realistic and let alone up to date as they do not reflect the financial and credit health of the company at each point in time. This difference between market and book values is more acute in distressed companies. We only have to look at the P/B multiples to observe the deep discount embedded in the book equity (Sweeny 2001).

In summary our analysis attempts to estimate a fair market price for the debt given the absence of market prices through the sample period. This inevitably entails a subjective (but empirical in our case) judgment.

Inputs and assumptions

Broadly speaking, the estimation of the WACC under the CAPM framework is a very subjective exercise due to the underlying assumptions. This is far more obvious when estimating the WACC in “distress”. The most controversial assumptions of our empirical project are:

- *Beta*: we have used the adjusted beta but not the relevered industry beta for each company. This was our initial aim but we had to compromise on that after struggling to gather a reliable trading comparable company group for each of our firms in the samples. Likewise, to envisage the target D/E for each company across our three periods would have turned out to be a very challenging exercise. However, the adjusted beta is giving us the market perception of the company’s risk so it is not such a bad estimation.
- *Equity Risk Premium*: we have used the standard 5% ERP in our calculations. We could have relied on Bloomberg's, Damodaran, Reuters or otherwise our own estimation at each point in time for our companies. However, again this is a very subjective exercise and given the fact that these

three data sources are very reliable and tend to suggest an ERP between 4%-6% between 1970-2009, we use the averaged mid-point at 5% through the sample period. We also provide for an ERP related sensitivity table in our WACC to assess the levels in a changing ERP environment. Our own estimations of ERP are also pointing to a mid-point of 5%, in line with these databases[70].

- *Estimation of market debt*: as we pointed out above, this is our most controversial assumption. The lack of market data did not discourage us from pursuing our goal and we came up with the bond approach. To our surprise, the outcome was in line with the trading levels of distressed debt nowadays. We have also looked at the P/B to evaluate the consistency between the market value of debt and equity and we found very encouraging results.

WACC dates

We have selected three WACC dates as outlined above. We have decided to choose at least one year before and after the event to allow the market to anticipate the potential restructuring/liquidation in the former and to evaluate the merits of the restructuring in the latter. We could have gone two years after the restructuring but we wanted to focus on the merits of the restructuring on the WACC rather than the fundamental improvement or deterioration of the company's financials.

[70] The outstanding work of Damodaran on the ERP supports even more our standardized 5% for the period.

APPENDIX 1 – European sample – Main Financial metrics

In millions per currency	EBIT			Interest cost			Gross Debt			Market Value Debt			Average Debt Age (years)			Book Equity			MarketCap		
Name	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**
MICROLOGICA AG	(2.64)	(2.07)	(3.27)	0.00	0.22	0.26	0.69	4.25	4.13	0.62	2.39	4.13	1.70	1.70	1.70	15.11	4.76	(5.19)	19.05	27.93	2.39
PERFECT HOLDING SA	(8.94)	(22.07)	(27.70)	1.00	1.99	1.67	24.96	49.65	41.76	10.26	20.79	41.76	1.80	1.80	1.80	120.30	35.60	21.25	393.40	21.28	136.00
SAUNALAHTI GROUP OYJ	(0.09)	(42.56)	0.63	0.49	0.60	0.96	12.21	7.20	23.99	2.32	(4.07)	23.99	2.40	2.40	2.40	30.76	(7.18)	(5.41)	227.37	31.56	27.55
ALVERN NORWAY ASA	(1.27)	(5.66)	1.20	0.16	0.16	0.16	92.37	72.34	58.00	80.51	62.30	58.00	1.90	1.90	1.90	(89.03)	(83.05)	15.00	13.80	4.99	2.94
COMPLETEL	(18.00)	(20.97)	(7.90)	8.00	7.46	0.09	225.00	232.35	5.00	94.18	108.06	5.00	1.90	1.90	1.90	125.00	94.65	280.36	125.00	94.65	51.11
TELE2 NETHERLANDS HOLDING NV	(55.63)	(31.76)	(13.99)	46.16	47.61	0.91	1,762.26	1,765.92	42.57	314.80	282.30	42.57	3.40	3.40	3.40	107.66	(114.29)	503.56	300.62	45.67	516.98
SER SYSTEMS AG	(10.92)	(131.80)	(28.00)	1.71	1.60	1.12	42.70	39.94	28.00	9.72	9.04	28.00	2.30	2.30	2.30	170.47	7.71	7.71	77.24	1.82	2.80
JAZZTEL PLC	(38.27)	(34.33)	(21.97)	20.27	26.93	3.00	862.88	807.65	119.44	484.60	347.36	119.44	2.00	2.00	2.00	26.79	(105.17)	333.69	204.33	109.04	202.66
WWL INTERNET AG	(1.54)	(1.43)	(0.20)	0.02	0.02	0.02	1.20	0.98	0.98	0.85	0.58	0.98	2.10	2.10	2.10	13.55	7.19	7.19	12.50	1.33	0.54
BAEURER AG	(10.48)	(0.75)	(0.75)	0.61	0.06	0.06	25.33	12.10	12.10	8.10	9.04	12.10	3.10	3.10	3.10	12.07	6.76	6.76	13.86	4.19	3.31
ASPIRO AB	(48.52)	(15.24)	(6.30)	0.26	0.50	0.05	6.31	5.80	1.30	0.07	(5.51)	1.30	2.80	2.80	2.80	191.45	29.90	43.99	80.04	15.68	95.41
LIBERTY GLOBAL EUROPE-A	(43.68)	(116.96)	(63.24)	231.40	213.95	78.04	9,744.93	8,915.75	8,095.84	4,538.67	4,119.11	8,095.84	2.40	2.40	2.40	(2,688.89)	(3,109.12)	100.00	230.58	26.61	44.34
JOMED NV	8.37	2.96	2.96	0.51	0.94	0.94	32.53	69.03	55.00	22.88	50.41	55.00	1.80	1.80	1.80	406.62	417.87	417.87	1,229.22	347.42	1.42
AGIPLAN TECHNOSOFT AG	(0.24)	(0.12)	0.80	0.00	0.00	0.00	0.20	0.11	0.11	0.16	0.08	0.11	1.80	1.80	1.80	14.42	14.23	14.23	27.90	1.08	0.78
GEOSENTRIC OYJ	(3.70)	(2.00)	(0.75)	0.08	0.08	0.29	1.90	1.10	7.20	0.45	(0.23)	7.20	2.25	2.25	2.25	9.40	(6.40)	2.42	13.20	6.34	6.50
GARANT SCHUH & MODE AG-VORZU	2.81	4.28	4.20	1.98	1.98	1.98	110.97	191.95	191.95	69.35	142.87	191.95	2.20	2.20	2.20	35.97	28.75	28.75	23.69	23.42	16.47
PGAM ADVANCED TECHNOLOGIES	1.41	1.23	0.80	1.52	1.51	1.28	37.88	37.79	32.00	11.60	11.90	32.00	2.10	2.10	2.10	31.57	36.42	36.42	48.82	21.95	1.08
NOVEMBER AG	(0.30)	(1.33)	(1.94)	0.01	0.01	0.02	0.35	0.23	0.28	0.14	0.09	0.28	1.90	1.90	1.90	23.98	21.43	10.00	24.05	20.54	9.61
WCM BETEILIGUNGS & GRUND AG	(14.69)	(1.87)	(1.87)	34.17	36.50	30.00	396.57	381.99	381.99	125.50	96.17	381.99	1.10	1.10	1.10	191.02	168.15	168.15	135.75	58.92	20.80
SCANMINING AB	(44.85)	(37.21)	(37.21)	10.22	11.00	7.79	255.51	194.78	194.78	92.87	28.67	194.78	1.90	1.90	1.90	440.09	420.84	420.84	2,031.05	383.00	386.83
INKU AG	(0.17)	(0.64)	(0.64)	0.35	0.01	0.01	6.34	0.19	0.19	1.17	0.05	0.19	1.85	1.85	1.85	(0.81)	2.33	2.33	3.90	5.42	2.71
EAG-BETEILIGUNGS AG	(6.18)	(30.52)	(12.00)	4.94	4.94	4.94	109.27	60.68	40.00	69.44	24.77	40.00	1.00	1.00	1.00	41.87	6.20	7.00	39.60	11.49	3.14
KAMPA AG	(8.68)	(3.85)	1.50	0.47	0.15	0.15	8.01	8.94	7.00	1.83	6.62	7.00	1.70	1.70	1.70	35.91	36.14	30.00	43.56	37.26	3.18
ORCO PROPERTY GROUP	2.00	(137.85)	4.90	20.04	13.45	25.03	1,473.76	1,565.76	1,558.70	1,014.53	1,232.68	1,558.70	2.25	2.25	2.25	940.53	425.85	95.79	615.10	70.81	82.08
ARCANDOR AG	(147.01)	(18.70)	(18.70)	77.76	147.19	147.19	2,866.39	3,932.77	3,932.77	1,687.56	1,877.50	3,932.77	1.70	1.70	1.70	2,053.38	727.43	727.43	1,687.41	415.29	45.83
EDOB ABWICKLUNGS AG	(4.50)	(12.10)	(12.10)	10.17	19.64	19.64	203.30	212.70	212.70	106.88	43.89	212.70	1.20	1.20	1.20	118.10	(16.90)	(16.90)	231.06	53.09	7.55

Source: Author

APPENDIX 1– European sample – Main Financial metrics

In millions per currency	MarketCap			Price to Book			EBITDA			Net Income			FFO			Net Debt			Cash		
Name	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**	**FY-1**	**FY**	**FY1**
MICROLOGICA AG	19.05	27.93	2.39	1.3x	5.9x	(0.5x)	-2.14	-1.85	-2.54	(2.60)	(2.17)	(2.80)	(2.10)	(1.95)	(2.07)	(3.78)	3.09	0.83	4.47	1.17	3.30
PERFECT HOLDING SA	393.40	21.28	136.00	3.3x	0.6x	6.4x	-8.24	-18.63	-25.29	(8.15)	(12.30)	0.50	(7.44)	(8.86)	2.91	16.22	42.44	39.68	8.74	7.22	2.08
SAUNALAHTI GROUP OYJ	227.37	31.56	27.55	7.4x	(4.4x)	(5.1x)	-0.09	-42.56	0.63	0.18	(47.32)	(1.80)	0.18	(47.32)	(1.80)	7.12	5.39	21.43	5.09	1.82	2.56
ALVERN NORWAY ASA	13.80	4.99	2.94	(0.2x)	(0.1x)	0.2x	-1.27	-5.66	1.20	(1.49)	(6.14)	(6.14)	(1.49)	(6.14)	(6.14)	89.45	68.29	53.95	2.92	4.05	4.05
COMPLETEL	125.00	94.65	51.11	1.0x	1.0x	0.2x	-18.00	-20.97	-0.30	(40.63)	(28.03)	(7.79)	(40.63)	(28.03)	(0.20)	225.00	176.18	(50.31)		56.17	55.31
TELE2 NETHERLANDS HOLDING NV	300.62	45.67	516.98	2.8x	(0.4x)	1.0x	-20.54	-0.92	22.22	(108.10)	(84.85)	(11.51)	(73.01)	(54.01)	24.70	805.12	1,132.35	(110.99)	957.14	633.57	153.56
SER SYSTEMS AG	77.24	1.82	2.80	0.5x	0.2x	0.4x	-4.26	-41.49	62.32	(6.60)	(155.21)	(155.21)	0.06	(64.89)	(64.89)	37.66	34.10	22.15	5.04	5.85	5.85
JAZZTEL PLC	204.33	109.04	202.66	7.6x	(1.0x)	0.6x	-20.90	-14.92	-3.99	(3.28)	(45.20)	(21.39)	14.09	(25.78)	(3.42)	623.84	719.84	99.97	239.03	87.81	19.47
WWL INTERNET AG	12.50	1.33	0.54	0.9x	0.2x	0.1x	-0.74	-0.81	0.43	(1.53)	(6.37)	(6.37)	(0.74)	(5.74)	(5.74)	(0.13)	0.35	0.35	1.33	0.64	0.64
BAEURER AG	13.86	4.19	3.31	1.1x	0.6x	0.5x	-0.75	0.39	0.39	(14.68)	(2.24)	(2.24)	(4.95)	(1.10)	(1.10)	23.66	10.10	10.10	1.66	1.99	1.99
ASPIRO AB	80.04	15.68	95.41	0.4x	0.5x	2.2x	-45.26	-3.94	-4.23	(37.02)	(53.68)	(7.67)	(33.76)	(42.38)	(5.59)	(10.23)	(13.75)	(3.87)	16.54	19.55	5.17
LIBERTY GLOBAL EUROPE-A	230.58	26.61	44.34	(0.1x)	(0.0x)	0.4x	323.57	72.82	107.41	(2,289.80)	(364.32)	75.16	(1,922.55)	(174.54)	245.81	8,889.93	8,614.65	7,917.34	855.00	301.09	178.50
JOMED NV	1,229.22	347.42	1.42	3.0x	0.8x	0.0x	8.37	2.96	2.96	9.26	1.86	1.86	9.26	1.86	1.86	17.07	52.03	38.01	15.46	16.99	16.99
AGIPLAN TECHNOSOFT AG	27.90	1.08	0.78	1.9x	0.1x	0.1x	-0.04	0.10	1.01	(0.13)	(0.10)	(0.10)	0.07	0.12	0.12	(2.53)	(0.52)	(0.52)	2.73	0.63	0.63
GEOSENTRIC OYJ	13.20	6.34	6.50	1.4x	(1.0x)	2.7x	-3.70	-2.00	-0.63	(4.30)	(10.30)	11.74	(4.30)	(10.30)	11.85	1.00	0.80	6.17	0.90	0.30	1.03
GARANT SCHUH & MODE AG-VORZU	23.69	23.42	16.47	0.7x	0.8x	0.6x	5.09	10.17	10.09	1.87	0.93	0.93	4.15	6.82	6.82	102.10	177.43	177.43	8.87	14.53	14.53
PGAM ADVANCED TECHNOLOGIES	48.82	21.95	1.08	1.5x	0.6x	0.0x	3.03	2.89	2.46	0.83	0.11	0.11	2.45	1.77	1.77	35.58	34.65	28.86	2.30	3.14	3.14
NOVEMBER AG	24.05	20.54	9.61	1.0x	1.0x	1.0x	-0.35	-1.18	2.60	(0.21)	(1.42)	(2.48)	(0.26)	(1.27)	2.06	(2.84)	(1.65)	(0.96)	3.19	1.89	1.24
WCM BETEILIGUNGS & GRUND AG	135.75	58.92	20.80	0.7x	0.4x	0.1x	-8.89	-1.79	-1.79	(21.28)	(9.83)	(9.83)	(15.47)	(9.75)	(9.75)	300.38	307.91	307.91	96.19	74.09	74.09
SCANMINING AB	2,031.05	383.00	386.83	4.6x	0.9x	0.9x	-29.76	-22.12	-22.12	(48.06)	(41.32)	(41.32)	(32.97)	(26.23)	(26.23)	224.27	186.68	186.68	31.23	8.10	8.10
INKU AG	3.90	5.42	2.71	(4.8x)	2.3x	1.2x	-0.03	-0.53	-0.53	(0.35)	(0.70)	(0.70)	(0.21)	(0.58)	(0.58)	5.98	(0.03)	(0.03)	0.36	0.22	0.22
EAG-BETEILIGUNGS AG	39.60	11.49	3.14	0.9x	1.9x	0.4x	-0.87	-25.58	-7.06	(9.94)	(36.01)	(36.01)	(4.64)	(31.07)	(31.07)	92.53	46.51	25.83	16.74	14.17	14.17
KAMPA AG	43.56	37.26	3.18	1.2x	1.0x	0.1x	-7.81	-3.01	2.34	(8.79)	(3.86)	(3.86)	(7.92)	(3.02)	(3.02)	6.82	7.89	5.95	1.19	1.05	1.05
ORCO PROPERTY GROUP	615.10	70.81	82.08	0.7x	0.2x	0.9x	2.00	-137.85	4.90	(13.09)	(360.78)	(15.60)	(13.09)	(360.78)	(15.60)	1,292.21	1,499.06	1,510.23	181.55	66.70	48.46
ARCANDOR AG	1,687.41	415.29	45.83	0.8x	0.6x	0.1x	-38.87	90.28	90.28	(119.26)	(57.97)	(57.97)	(11.12)	51.01	51.01	1,731.38	3,157.77	3,157.77	1,135.01	775.00	775.00
EDOB ABWICKLUNGS AG	231.06	53.09	7.55	2.0x	(3.1x)	(0.4x)	1.90	-5.40	-5.40	(11.30)	(82.60)	(82.60)	(4.90)	(75.90)	(75.90)	160.30	194.70	194.70	43.00	18.00	18.00

Source: Author

APPENDIX 1 – European sample – Main credit metrics

	FFO/Debt			Debt/Ebitda			Ebitda/Interest			Ebit/Interest			ROCE		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
MICROLOGICA AG	(12.1x)	(1.8x)	(2.0x)	(0.1x)	(0.6x)	(0.4x)	(2,136.0x)	(8.5x)	(9.9x)	(2,637.0x)	(9.5x)	(12.8x)	(65.7%)	(96.3%)	-
PERFECT HOLDING SA	(1.2x)	(0.7x)	0.3x	(0.8x)	(0.7x)	(0.4x)	(8.2x)	(9.4x)	(15.1x)	(9.0x)	(11.1x)	(16.6x)	(22.4%)	(57.7%)	3.2%
SAUNALAHTI GROUP OYJ	0.1x	(26.3x)	(0.3x)	(33.9x)	(0.0x)	9.5x	(0.2x)	(70.9x)	0.7x	(0.2x)	(70.9x)	0.7x	1.7%	-	-
ALVERN NORWAY ASA	(0.1x)	(0.3x)	(0.4x)	(18.2x)	(3.2x)	12.1x	(8.2x)	(36.5x)	7.7x	(8.2x)	(36.5x)	7.7x	-	-	(33.6%)
COMPLETEL	(0.7x)	(0.5x)	(0.2x)	(3.1x)	(2.8x)	(4.2x)	(2.3x)	(2.8x)	(3.3x)	(2.3x)	(2.8x)	(85.8x)	(46.4%)	(34.3%)	(10.9%)
TELE2 NETHERLANDS HOLDING NV	(0.2x)	(0.1x)	2.3x	(21.4x)	(477.8x)	0.5x	(0.4x)	(0.0x)	24.4x	(1.2x)	(0.7x)	(15.4x)	(23.1%)	-	(8.4%)
SER SYSTEMS AG	0.0x	(6.5x)	(9.3x)	(2.5x)	(0.2x)	0.1x	(2.5x)	(26.0x)	55.6x	(6.4x)	(82.5x)	(25.0x)	(12.4%)	(1,302.9%)	(1,738.7%)
JAZZTEL PLC	0.1x	(0.1x)	(0.1x)	(10.3x)	(13.5x)	(7.5x)	(1.0x)	(0.6x)	(1.3x)	(1.9x)	(1.3x)	(7.3x)	(1.5%)	-	(18.9%)
WWL INTERNET AG	(2.5x)	(23.4x)	(23.4x)	(0.4x)	(0.3x)	0.6x	(46.1x)	(40.3x)	21.3x	(95.9x)	(71.5x)	(10.0x)	(41.6%)	(311.5%)	(311.5%)
BAEURER AG	(0.8x)	(0.4x)	(0.4x)	(8.5x)	7.7x	7.7x	(1.2x)	6.1x	6.1x	(17.1x)	(11.7x)	(11.7x)	(157.0%)	(47.5%)	(47.5%)
ASPIRO AB	(21.4x)	(29.2x)	(17.2x)	(0.0x)	(0.4x)	(0.1x)	(171.4x)	(7.9x)	(84.6x)	(183.8x)	(30.5x)	(126.1x)	(74.9%)	(601.5%)	(67.7%)
LIBERTY GLOBAL EUROPE-A	(0.8x)	(0.1x)	0.1x	7.5x	30.6x	18.8x	1.4x	0.3x	1.4x	(0.2x)	(0.5x)	(0.8x)	-	-	3.7%
JOMED NV	1.1x	0.1x	0.1x	1.0x	5.8x	4.7x	16.5x	3.1x	3.1x	16.5x	3.1x	3.1x	8.4%	1.5%	1.6%
AGIPLAN TECHNOSOFT AG	1.4x	4.2x	4.2x	(1.3x)	0.3x	0.0x	(20.0x)	48.0x	506.0x	(120.5x)	(58.0x)	400.0x	(3.6%)	(2.6%)	(2.6%)
GEOSENTRIC OYJ	(9.1x)	(37.5x)	6.6x	(0.1x)	(0.1x)	(2.9x)	(48.7x)	(26.3x)	(2.2x)	(48.7x)	(26.3x)	(2.6x)	(152.2%)	-	488.4%
GARANT SCHUH & MODE AG-VORZU	0.1x	0.1x	0.1x	5.4x	4.7x	4.8x	2.6x	5.1x	5.1x	1.4x	2.2x	2.1x	5.1%	1.7%	1.7%
PGAM ADVANCED TECHNOLOGIES	0.3x	0.2x	0.2x	3.1x	3.3x	3.3x	2.0x	1.9x	1.9x	0.9x	0.8x	0.6x	4.8%	0.6%	0.6%
NOVEMBER AG	(3.0x)	(21.9x)	29.9x	(0.3x)	(0.0x)	0.0x	(25.0x)	(127.7x)	173.3x	(21.0x)	(144.2x)	(129.3x)	(3.4%)	(26.2%)	(96.4%)
WCM BETEILIGUNGS & GRUND AG	(0.2x)	(0.1x)	(0.1x)	(11.1x)	(53.4x)	(53.4x)	(0.3x)	(0.0x)	(0.1x)	(0.4x)	(0.1x)	(0.1x)	(14.5%)	(7.1%)	(7.1%)
SCANMINING AB	(0.5x)	(0.5x)	(0.5x)	(2.1x)	(2.2x)	(2.2x)	(2.9x)	(2.0x)	(2.8x)	(4.4x)	(3.4x)	(4.8x)	(27.6%)	(26.8%)	(26.8%)
INKU AG	(0.1x)	(12.1x)	(12.1x)	(58.7x)	(0.1x)	(0.1x)	(0.1x)	(52.8x)	(52.8x)	(0.5x)	(64.4x)	(64.4x)	-	(110.9%)	(110.9%)
EAG-BETEILIGUNGS AG	(0.2x)	(2.0x)	(3.1x)	(31.3x)	(0.6x)	(1.4x)	(0.2x)	(5.2x)	(1.4x)	(1.3x)	(6.2x)	(2.4x)	(26.3%)	(215.4%)	(306.5%)
KAMPA AG	(4.0x)	(1.3x)	(1.7x)	(0.3x)	(0.7x)	0.7x	(16.7x)	(20.6x)	16.1x	(18.5x)	(26.4x)	10.3x	(80.0%)	(34.2%)	(41.7%)
ORCO PROPERTY GROUP	(0.0x)	(0.9x)	(0.0x)	183.9x	(2.8x)	79.5x	0.1x	(10.2x)	0.2x	0.1x	(10.2x)	0.2x	(2.2%)	(72.5%)	(3.8%)
ARCANDOR AG	(0.0x)	0.1x	0.1x	(18.4x)	10.9x	10.9x	(0.5x)	0.6x	0.6x	(1.9x)	(0.1x)	(0.1x)	(9.7%)	(5.0%)	(5.0%)
EDOB ABWICKLUNGS AG	(0.1x)	(1.4x)	(1.4x)	26.8x	(9.8x)	(9.8x)	0.2x	(0.3x)	(0.3x)	(0.4x)	(0.6x)	(0.6x)	(14.1%)	-	-

Source: Author

APPENDIX 1 – European sample – Credit metric ratings and synthetic spreads

	FFO/Net Debt			Net Debt/Ebitda			Ebitda/Interest			Ebit/Interest			ROCE			Scoring			Blended rating			Spread		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
MICROLOGICA AG	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
PERFECT HOLDING SA	CCC	CCC	BB	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	6.2	D	D	CCC-	16.0%	16.0%	9.0%
SAUNALAHTI GROUP OYJ	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
ALVERN NORWAY ASA	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	BBB	CCC	CCC	BBB	CCC	CCC	CCC	7.0	7.0	6.3	D	D	CCC-	16.0%	16.0%	9.0%
COMPLETEL	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
TELE2 NETHERLANDS HOLDING NV	CCC	CCC	AAA	CCC	CCC	AA	CCC	CCC	A	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	2.6	D	D	A-	16.0%	16.0%	1.5%
SER SYSTEMS AG	CCC	CCC	CCC	CCC	CCC	AAA	CCC	CCC	AAA	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	4.5	D	D	BB+	16.0%	16.0%	3.5%
JAZZTEL PLC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
WWL INTERNET AG	CCC	CCC	CCC	CCC	CCC	AA	CCC	CCC	A	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	5.0	D	D	B+	16.0%	16.0%	4.3%
BAEURER AG	CCC	CCC	CCC	CCC	CCC	CCC	CCC	BB	BB	CCC	CCC	CCC	CCC	CCC	CCC	7.0	6.8	6.8	D	C	C	16.0%	5.5%	14.0%
ASPIRO AB	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
LIBERTY GLOBAL EUROPE-A	CCC	CCC	B	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	6.6	D	D	C+	16.0%	16.0%	13.0%
JOMED NV	AA	CCC	B	A	CCC	B	A	B	B	A	BB	BB	CCC	CCC	CCC	2.8	6.6	5.9	A-	C+	B-	1.5%	13.0%	5.5%
AGIPLAN TECHNOSOFT AG	AA	AAA	AAA	CCC	AAA	AAA	CCC	AAA	AAA	CCC	CCC	AAA	CCC	CCC	CCC	5.0	2.1	1.4	B+	A+	AA+	1.5%	1.0%	0.6%
GEOSENTRIC OYJ	CCC	CCC	AAA	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	AAA	7.0	7.0	4.2	D	D	BB+	16.0%	16.0%	3.5%
GARANT SCHUH & MODE AG-VORZU	B	B	B	CCC	B	B	B	BB	BB	B	B	B	CCC	CCC	CCC	6.4	5.9	5.9	CC+	B-	B-	10.0%	5.5%	5.5%
PGAM ADVANCED TECHNOLOGIES	BB	B	B	BB	BB	BB	B	B	B	CCC	CCC	CCC	CCC	CCC	CCC	5.5	5.9	5.9	B+	B-	B-	4.3%	5.5%	5.5%
NOVEMBER AG	CCC	CCC	AAA	CCC	CCC	AAA	CCC	CCC	AAA	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	2.1	D	D	A+	16.0%	16.0%	1.0%
WCM BETEILIGUNGS & GRUND AG	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
SCANMINING AB	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
INKU AG	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
EAG-BETEILIGUNGS AG	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
KAMPA AG	CCC	CCC	CCC	CCC	CCC	AA	CCC	CCC	A	CCC	CCC	A	CCC	CCC	CCC	7.0	7.0	4.5	D	D	BB	16.0%	16.0%	4.0%
ORCO PROPERTY GROUP	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
ARCANDOR AG	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
EDOB ABWICKLUNGS AG	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%

Source: Author

APPENDIX 1 – American sample – Main Financial metrics

	EBIT			Interest Cost		Gross Debt			Market value debt			Average Debt Age (years)		
Name	FY-1	FY	FY1	FY-1	FY	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
SMC VENTURES INC	(0.92)	(3.28)	(0.19)	0.13	0.07	4.00	3.80	2.50	1.19	2.08	2.50	2.5	2.5	2.5
CYTOMEDIX INC	(3.35)	(2.38)	(0.54)	0.00	0.00	0.22	3.98	0.80	0.15	3.19	0.80	2.1	2.1	2.1
USG CORP	184.00	32.00	50.00	13.00	14.00	701.00	786.00	450.00	459.96	532.62	450.00	1.8	1.8	1.8
FRIEDE GOLDMAN HALTER INC	(11.53)	(63.25)	(60.49)	8.39	8.67	310.64	286.70	109.24	169.59	148.08	109.24	1.8	1.8	1.8
PROTEONOMIX INC	(0.63)	(0.66)	(0.17)	0.13	0.06	5.63	4.95	3.08	2.79	3.40	3.08	2.2	2.2	2.2
RADNET INC	(0.19)	3.32	1.08	3.93	4.47	174.88	170.11	169.29	108.10	94.55	169.29	1.9	1.9	1.9
AMERICAN WAGERING INCORP	0.15	0.13	0.04	0.05	0.04	1.81	1.73	1.95	1.27	1.32	1.95	1.2	1.2	1.2
AMERCO	(12.25)	14.26	(1.03)	28.70	35.00	1,487.17	1,543.88	857.78	903.17	892.82	857.78	2.1	2.1	2.1
WEIRTON STEEL CORP	(36.42)	(21.50)	(29.66)	11.30	4.96	427.62	438.96	188.73	139.71	294.11	188.73	2.8	2.8	2.8
RAHAXI INC	(2.07)	(0.62)	(2.77)	0.01	0.01	0.85	1.00	0.50	0.71	0.82	0.50	1.8	1.8	1.8
PRESIDENT CASINOS INC	(0.90)	1.24	0.49	3.81	3.72	108.94	107.21	30.00	49.59	50.08	30.00	1.8	1.8	1.8
NATIONAL STEEL CORP-CL B	(60.20)	(171.20)	7.50	15.50	19.30	695.50	939.00	96.70	346.15	493.41	96.70	2.4	2.4	2.4
ZAP	(1.02)	(2.47)	(0.51)	0.01	0.01	0.28	1.70	2.30	0.12	1.39	2.30	1.9	1.9	1.9
SOFTLOCK.COM INC	(3.63)	(0.66)	0.10	0.03	0.03	0.90	0.77	0.45	0.17	0.06	0.45	2.9	2.9	2.9
HERBORIUM GROUP INC	(0.22)	(0.81)	1.00	0.04	0.05	4.13	3.09	4.50	2.89	1.83	4.50	2.5	2.5	2.5
COMPOSITE TECHNOLOGY CORPORA	(3.09)	(3.44)	(4.13)	0.01	0.01	0.90	1.04	8.87	0.66	0.78	8.87	1.8	1.8	1.8
INTELLIGENT COMMUNICATION EN	(5.03)	(2.54)	(0.04)	0.14	0.19	9.40	7.80	1.50	6.95	5.09	1.50	1.6	1.6	1.6
EPICUS COMMUNICATIONS GROUP	(0.12)	(1.71)	(0.55)	0.05	0.06	2.49	3.02	10.31	1.34	1.55	10.31	2.5	2.5	2.5
AIR INDUSTRIES GROUP INC	0.08	(0.86)	(0.15)	0.01	0.02	0.28	0.53	13.86	0.05	0.04	13.86	3.4	3.4	3.4
NEWTON ENERGY CORP	(0.28)	(0.36)	(0.09)	0.23	0.18	14.13	10.46	8.80	7.55	5.36	8.80	2.9	2.9	2.9
MEDIA 100 INC	(0.94)	(1.86)	(1.86)	0.63	0.50	25.00	22.00	20.00	13.41	12.66	20.00	2.1	2.1	2.1
INTL THOROUGHBRED BREEDERS	(1.31)	(0.79)	0.22	1.78	2.43	55.14	40.44	76.48	23.02	0.28	76.48	2.1	2.1	2.1
MEDICAL STAFFING SOLUTIONS I	2.84	2.84	(0.35)	0.18	0.09	3.13	2.77	4.73	0.09	1.07	4.73	2.1	2.1	2.1
U.S. ENERGY SYSTEMS INC	2.94	(0.93)	(11.22)	2.70	5.77	89.16	258.64	206.60	44.62	157.09	206.60	1.9	1.9	1.9
PILGRIM'S PRIDE CORP	136.78	(39.08)	129.13	9.03	9.42	481.27	482.78	175.00	361.36	365.79	175.00	1.4	1.4	1.4
GBO INC	(1.25)	1.43	(3.57)	1.35	1.07	48.21	45.60	16.34	19.19	20.81	16.34	2.5	2.5	2.5
PROLOGIC MANAGEMENT SYSTEMS	(0.94)	(0.54)	(0.04)	0.17	0.12	8.60	9.73	1.13	5.83	7.46	1.13	1.8	1.8	1.8
FACTORY 2-U STORES INC	(4.77)	(3.92)	(3.77)	0.16	0.16	15.75	17.00	35.00	10.72	11.82	35.00	2.8	2.8	2.8
SIRICOMM INC	(0.65)	(0.17)	(0.15)	0.00	0.20	0.00	1.90	2.20	0.00	(1.74)	2.20	2.4	2.4	2.4
CHESAPEAKE CORP	11.50	11.70	12.90	11.60	12.30	515.30	557.40	386.40	325.50	370.07	386.40	1.8	1.8	1.8
TELEMETRIX INC	(0.27)	(0.17)	(0.41)	0.23	0.30	7.00	8.28	3.79	3.08	3.41	3.79	2.0	2.0	2.0
PFF BANCORP INC	14.34	16.16	24.06	21.23	39.27	772.03	1,256.63	1,023.15	382.23	575.88	1,023.15	2.1	2.1	2.1
INTROGEN THERAPEUTICS INC	(7.16)	(4.62)	(7.82)	0.16	0.16	7.74	7.41	7.98	4.71	4.57	7.98	2.1	2.1	2.1
BUTLER INTL INC	0.27	(0.12)	2.26	1.73	1.73	67.49	67.49	64.57	29.25	29.60	64.57	2.5	2.5	2.5
MOTORS LIQUIDATION CO	2,083.00	1,257.00	2,045.00	721.00	1,230.00	43,211.00	54,402.00	27,402.00	26,450.43	27,937.63	27,402.00	2.4	2.4	2.4
VISTEON CORP	127.00	(15.00)	50.00	57.00	55.00	2,844.00	2,715.00	1,930.00	1,886.14	1,809.61	1,930.00	1.8	1.8	1.8
CAPITAL CORP OF THE WEST	-	-	-	-	-	403.76	347.41	139.40	295.76	257.31	139.40	3.1	3.1	3.1
CIB MARINE BANCSHARES INC	-	-	-	-	-	177.12	95.96	21.00	136.76	73.83	21.00	2.9	2.9	2.9
WALKING CO HOLDINGS INC/THE	1.44	(4.41)	2.22	1.03	1.03	62.09	62.09	45.00	40.11	38.69	45.00	2.4	2.4	2.4
COOPER-STANDARD HOLDING	41.04	(0.50)	42.65	20.00	21.10	1,124.32	1,150.51	473.10	773.12	759.83	473.10	2.0	2.0	2.0
LUNA INNOVATIONS INC	(1.76)	(2.25)	(0.47)	0.14	0.14	10.01	9.30	7.07	7.71	6.86	7.07	1.8	1.8	1.8
MEDCOM USA	(0.03)	(0.13)	(0.13)	0.03	0.03	0.96	0.96	0.25	0.52	0.54	0.25	1.8	1.8	1.8
ASYST TECHNOLOGIES INC	(15.17)	(2.12)	(2.12)	1.95	2.65	155.85	158.99	158.99	112.16	98.89	158.99	2.4	2.4	2.4
ABITIBIBOWATER INC	(162.00)	(46.00)	(114.00)	129.00	192.00	5,957.00	6,150.00	1,266.00	3,426.06	2,426.25	1,266.00	2.3	2.3	2.3
GENERAL GROWTH PROPERTIES	(7.04)	(92.83)	(53.00)	342.01	343.99	24,365.83	24,702.81	24,641.40	18,423.38	18,250.82	24,641.40	1.9	1.9	1.9
HOWARD HUGHES CORP/THE	(80.00)	(125.00)	(5.21)	0.98	1.20	255.00	209.00	205.00	227.61	175.52	205.00	2.1	2.1	2.1

Source: Author

APPENDIX 1 – American sample – Main Financial metrics

	Equity			MarketCap			P/BV			EBITDA			Net Debt		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
SMC VENTURES INC	24.66	14.41	(17.38)	33.65	8.41	10.51	1.36	0.58	(0.60)	(0.35)	(3.00)	0.13	(5.91)	2.23	(0.78)
CYTOMEDIX INC	4.45	(0.47)	1.72	78.10	6.09	5.11	17.54	(12.97)	2.97	(3.34)	(2.17)	(0.33)	(1.90)	3.91	(0.15)
USG CORP	882.00	513.00	527.00	1,422.40	161.92	309.24	1.61	0.32	0.59	209.00	59.00	75.00	680.00	391.00	(146.00)
FRIEDE GOLDMAN HALTER INC	94.98	209.79	(193.35)	247.33	9.74	4.63	2.60	0.05	(0.02)	(1.76)	(53.42)	(56.53)	240.09	276.74	99.61
PROTEONOMIX INC	2.66	(2.88)	(6.35)	6.49	2.00	3.00	2.44	(0.69)	(0.47)	(0.63)	(0.65)	(0.17)	5.63	4.84	3.06
RADNET INC	(48.74)	(52.19)	(60.70)	32.80	8.22	17.68	(0.67)	(0.16)	(0.29)	3.93	7.54	5.55	174.84	170.08	169.25
AMERICAN WAGERING INCORP	4.38	2.99	1.93	2.66	1.41	2.59	0.61	0.47	1.34	0.25	0.21	0.13	0.21	0.22	(0.21)
AMERCO	662.77	520.76	401.84	316.27	83.70	503.60	0.48	0.16	1.25	15.07	41.59	27.35	1,478.11	1,499.81	819.57
WEIRTON STEEL CORP	(514.18)	(732.78)	(904.24)	35.98	2.00	0.08	(0.07)	(0.00)	(0.00)	(20.50)	(7.02)	(14.06)	327.54	393.32	178.24
RAHAXI INC	(0.14)	0.02	3.28	8.14	9.01	53.58	(56.91)	563.12	16.36	(2.06)	(0.56)	(2.62)	0.75	1.00	0.30
PRESIDENT CASINOS INC	(12.40)	(40.54)	(49.61)	2.52	3.27	2.21	(0.20)	(0.08)	(0.04)	1.20	3.36	2.58	97.80	98.65	20.55
NATIONAL STEEL CORP-CL B	717.70	(310.70)	(392.20)	44.32	19.76	0.77	0.06	(0.06)	(0.00)	(18.30)	(129.40)	47.30	648.90	935.30	81.50
ZAP	11.01	3.75	5.30	8.31	1.56	6.64	0.75	0.42	1.25	(0.85)	(2.20)	(0.44)	(2.38)	0.16	1.80
SOFTLOCK.COM INC	4.24	1.39	(0.00)	9.92	0.03	0.01	2.34	0.02	(6.11)	(3.35)	(0.51)	0.10	(3.38)	(2.39)	(2.80)
HERBORIUM GROUP INC	1.57	0.64	1.10	0.42	0.52	0.37	0.27	0.83	0.33	(0.15)	(0.75)	1.06	(0.71)	(0.63)	2.39
COMPOSITE TECHNOLOGY CORPORA	(0.22)	(0.93)	(9.13)	168.06	51.54	156.98	(767.40)	(55.60)	(17.19)	(3.07)	(3.32)	(3.93)	(2.03)	0.23	6.29
INTELLIGENT COMMUNICATION EN	5.22	(9.82)	(7.93)	45.58	2.56	7.05	8.73	(0.26)	(0.89)	(4.55)	(2.30)	(0.04)	(2.43)	4.71	1.20
EPICUS COMMUNICATIONS GROUP	(8.67)	(9.28)	(16.95)	6.21	0.33	2.51	(0.72)	(0.04)	(0.15)	(0.12)	(1.71)	(0.53)	2.21	2.90	10.02
AIR INDUSTRIES GROUP INC	(0.61)	(1.01)	0.11	1.34	0.23	0.42	(2.19)	(0.23)	3.71	0.08	(0.86)	(0.15)	0.28	0.53	13.86
NEWTON ENERGY CORP	5.64	6.85	1.40	5.64	6.85	1.40	1.00	1.00	1.00	(0.28)	(0.36)	(0.09)	14.13	10.46	8.80
MEDIA 100 INC	2.60	0.35	0.35	15.18	0.40	0.05	5.84	1.13	0.15	(0.58)	(1.57)	(1.57)	19.20	10.39	6.83
INTL THOROUGHBRED BREEDERS	57.92	15.78	(0.57)	27.58	0.80	0.03	0.48	0.05	(0.06)	(0.53)	(0.20)	0.82	54.54	39.83	75.88
MEDICAL STAFFING SOLUTIONS I	(0.38)	(0.38)	(9.53)	4.56	1.08	0.16	(11.96)	(2.84)	(0.02)	2.84	3.01	(0.16)	2.83	2.75	3.73
U.S. ENERGY SYSTEMS INC	30.60	12.37	32.37	21.59	70.12	7.60	0.71	5.67	0.23	4.04	0.72	(9.05)	88.97	253.21	195.95
PILGRIM'S PRIDE CORP	1,130.03	1,147.05	150.92	1,926.79	46.18	647.99	1.71	0.04	4.29	154.59	(20.14)	158.25	473.46	466.12	138.16
GBO INC	1.93	2.71	23.33	47.02	9.95	22.22	24.43	3.67	0.95	(0.51)	2.23	(2.85)	45.83	45.55	14.76
PROLOGIC MANAGEMENT SYSTEMS	(10.13)	(11.49)	(4.06)	1.31	0.44	0.15	(0.13)	(0.04)	(0.04)	(0.88)	(0.54)	(0.04)	8.15	9.42	1.05
FACTORY 2-U STORES INC	59.10	49.78	(37.28)	35.28	9.69	0.14	0.60	0.19	(0.00)	(2.89)	(0.19)	(0.24)	12.17	12.26	26.64
SIRICOMM INC	(1.45)	(2.64)	0.01	21.28	0.61	0.25	(14.72)	(0.23)	36.19	(0.64)	(0.17)	(0.15)	(0.08)	1.85	1.54
CHESAPEAKE CORP	481.50	519.70	654.70	103.07	1.27	0.10	0.21	0.00	0.00	30.90	23.10	25.90	496.30	543.10	378.70
TELEMETRIX INC	(4.55)	(4.55)	(11.49)	0.90	0.20	1.36	(0.20)	(0.04)	(0.12)	0.19	0.30	0.06	3.00	8.27	3.68
PFF BANCORP INC	289.21	286.13	330.42	272.40	0.19	0.14	0.94	0.00	0.00	16.38	18.17	26.64	718.20	1,216.12	977.89
INTROGEN THERAPEUTICS INC	30.51	22.21	18.57	128.56	10.59	0.62	4.21	0.48	0.03	(6.53)	(4.00)	(7.45)	(3.14)	(19.24)	(7.04)
BUTLER INTL INC	39.24	16.57	18.20	7.70	0.45	0.08	0.20	0.03	0.00	0.76	0.27	2.73	65.79	64.84	64.16
MOTORS LIQUIDATION CO	21,479.00	10,795.00	27,779.00	6,510.78	457.92	263.46	0.30	0.04	0.01	5,595.00	4,812.00	4,866.00	24,848.00	30,382.00	(2,499.00)
VISTEON CORP	149.00	(750.00)	(408.00)	528.55	9.78	192.87	3.55	(0.01)	(0.47)	293.00	161.00	152.00	1,231.00	2,111.00	966.00
CAPITAL CORP OF THE WEST	75.82	89.14	95.17	63.02	0.42	0.05	0.83	0.00	0.00	2.07	1.85	1.77	363.42	314.21	91.42
CIB MARINE BANCSHARES INC	26.00	(10.00)	76.87	9.17	0.55	2.94	0.35	(0.06)	0.04	10.14	(0.32)	(1.13)	82.12	53.96	(71.64)
WALKING CO HOLDINGS INC/THE	26.58	29.23	37.42	19.08	2.39	11.00	0.72	0.08	0.29	2.08	(3.46)	3.54	61.33	60.95	43.75
COOPER-STANDARD HOLDING	334.22	(376.04)	606.46	765.00	185.00	568.44	2.29	(0.49)	0.94	41.04	(0.50)	75.12	1,092.11	1,063.75	284.36
LUNA INNOVATIONS INC	15.44	(27.39)	8.52	50.39	5.59	28.37	3.26	(0.20)	3.33	(1.76)	(2.25)	(0.47)	(5.24)	(2.81)	0.80
MEDCOM USA	(5.05)	(6.06)	(6.06)	16.09	2.57	3.08	(3.18)	(0.42)	(0.51)	0.35	0.23	0.45	0.94	0.92	0.21
ASYST TECHNOLOGIES INC	87.73	(42.10)	(42.10)	173.93	14.19	0.35	1.98	(0.34)	(0.01)	(8.87)	5.04	4.46	60.18	82.44	82.44
ABITIBIBOWATER INC	1,765.00	(579.00)	(2,478.00)	679.24	29.28	11.49	0.38	(0.05)	(0.00)	(162.00)	(46.00)	(114.00)	5,665.00	5,969.00	516.00
GENERAL GROWTH PROPERTIES	2,539.23	1,952.96	1,160.17	9,337.68	222.64	5,105.42	3.68	0.11	4.40	47.58	(16.59)	133.12	24,109.37	24,507.07	24,068.28
HOWARD HUGHES CORP/THE	1,985.00	1,503.00	1,520.00	1,985.00	1,503.00	1,291.00	1.00	1.00	0.85	(80.00)	(125.00)	(5.21)	251.80	204.04	202.02

Source: Author

APPENDIX 1 – American sample – Main Financial metrics

	NET INCOME			FFO			Cash		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
SMC VENTURES INC	(0.12)	(3.34)	(2.36)	0.46	(3.07)	(2.05)	9.91	1.58	3.28
CYTOMEDIX INC	(1.01)	(7.99)	8.30	(1.00)	(7.78)	8.51	2.12	0.08	0.95
USG CORP	33.00	11.00	48.00	58.00	38.00	73.00	21.00	395.00	596.00
FRIEDE GOLDMAN HALTER INC	15.74	(73.20)	(9.01)	25.52	(63.37)	(5.05)	70.55	9.96	9.63
PROTEONOMIX INC	(1.96)	(3.00)	(0.53)	(1.96)	(2.99)	(0.53)	0.01	0.10	0.03
RADNET INC	2.44	(0.81)	(6.86)	6.56	3.41	(2.39)	0.04	0.03	0.04
AMERICAN WAGERING INCORP	(0.15)	(0.99)	(0.05)	(0.05)	(0.91)	0.04	1.59	1.51	2.16
AMERCO	60.01	(25.11)	44.42	87.33	2.22	72.80	9.06	44.07	38.20
WEIRTON STEEL CORP	(27.93)	(74.81)	(9.70)	(12.02)	(60.33)	5.90	100.08	45.65	10.48
RAHAXI INC	(0.04)	(4.97)	(1.27)	(0.04)	(4.91)	(1.12)	0.10	-	0.20
PRESIDENT CASINOS INC	(4.22)	(11.26)	0.36	(2.12)	(9.14)	2.44	11.14	8.56	9.45
NATIONAL STEEL CORP-CL B	(59.10)	(280.30)	(65.00)	(17.20)	(238.50)	(25.20)	46.60	3.70	15.20
ZAP	(1.10)	(3.47)	(0.44)	(0.93)	(3.19)	(0.37)	2.66	1.54	0.50
SOFTLOCK.COM INC	(3.27)	(0.66)	-	(2.99)	(0.52)	-	4.28	3.16	3.25
HERBORIUM GROUP INC	(1.50)	(1.01)	(1.01)	(1.42)	(0.95)	(0.95)	4.84	3.71	2.11
COMPOSITE TECHNOLOGY CORPORA	(2.81)	(4.62)	(6.52)	(2.79)	(4.50)	(6.32)	2.93	0.81	2.58
INTELLIGENT COMMUNICATION EN	(2.94)	(2.68)	(0.04)	(2.46)	(2.44)	(0.04)	11.83	3.10	0.30
EPICUS COMMUNICATIONS GROUP			(0.68)	-	-	(0.67)	0.28	0.12	0.29
AIR INDUSTRIES GROUP INC				-	-	-			
NEWTON ENERGY CORP				-	-	-			
MEDIA 100 INC	(0.99)	(1.97)	(1.97)	(0.63)	(1.68)	(1.68)	5.80	11.61	13.18
INTL THOROUGHBRED BREEDERS	(0.47)	(3.58)	(3.09)	0.31	(3.00)	(2.49)	0.60	0.60	0.60
MEDICAL STAFFING SOLUTIONS I	(0.59)	(0.49)	0.55	(0.59)	(0.31)	0.73	0.30	0.02	1.00
U.S. ENERGY SYSTEMS INC	(2.00)	12.45	(35.13)	(0.90)	14.10	(32.96)	0.20	5.44	10.66
PILGRIM'S PRIDE CORP	25.08	17.44	9.81	42.89	36.38	38.94	7.81	16.67	36.84
GBO INC	0.03	(3.15)	(0.53)	0.77	(2.35)	0.19	2.38	0.05	1.58
PROLOGIC MANAGEMENT SYSTEMS	(0.50)	(0.31)	(0.04)	(0.44)	(0.31)	(0.04)	0.45	0.31	0.08
FACTORY 2-U STORES INC	(1.63)	(16.02)	(74.74)	0.25	(12.28)	(71.22)	3.57	4.74	8.36
SIRICOMM INC	(0.16)	(0.38)	(0.68)	(0.16)	(0.38)	(0.67)	0.08	0.06	0.66
CHESAPEAKE CORP	21.60	(0.30)	9.40	41.00	11.10	22.40	19.00	14.30	7.70
TELEMETRIX INC	(0.38)	(7.24)	(0.10)	0.08	(6.77)	0.36	4.00	0.01	0.11
PFF BANCORP INC		9.55	9.42	2.03	11.56	11.99	53.83	40.51	45.26
INTROGEN THERAPEUTICS INC	(2.87)	(7.15)	(5.44)	(2.24)	(6.53)	(5.06)	10.88	26.66	15.02
BUTLER INTL INC	2.29	0.79	0.11	2.78	1.18	0.58	1.71	2.65	0.41
MOTORS LIQUIDATION CO	950.00	(987.00)	(3,383.00)	4,462.00	2,568.00	(562.00)	18,363.00	24,020.00	29,901.00
VISTEON CORP	280.00	(163.00)	3.00	446.00	13.00	105.00	1,613.00	604.00	964.00
CAPITAL CORP OF THE WEST		4.99	5.56	2.07	6.83	7.33	40.34	33.20	47.98
CIB MARINE BANCSHARES INC		(5.19)	(3.86)	10.14	(5.51)	(4.99)	95.00	42.00	92.64
WALKING CO HOLDINGS INC/THE	(3.83)	(2.41)	(3.16)	(3.19)	(1.46)	(1.84)	0.76	1.14	1.25
COOPER-STANDARD HOLDING			5.48	-	-	37.95	32.21	86.76	188.74
LUNA INNOVATIONS INC				-	-	-	15.25	12.11	6.27
MEDCOM USA	(0.53)	(1.25)	(1.85)	(0.15)	(0.89)	(1.27)	0.02	0.04	0.04
ASYST TECHNOLOGIES INC	(7.22)	(1.83)	(1.64)	(0.92)	5.33	4.95	95.67	76.55	76.55
ABITIBIBOWATER INC				-	-	-	292.00	181.00	750.00
GENERAL GROWTH PROPERTIES		59.12	2.65	54.62	135.36	188.77	256.46	195.75	573.12
HOWARD HUGHES CORP/THE				-	-	-	3.20	4.96	2.98

Source: Author

APPENDIX 1 – American sample – Main credit metrics

	FFO/Debt			Debt/Ebitda			Ebitda/Interest			Ebit/Interest			ROCE		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
SMC VENTURES INC	0.5x	(3.2x)	(3.3x)	(2.9x)	(0.3x)	4.8x	(2.7x)	(43.3x)	1.9x	(7.2x)	(47.3x)	(2.6x)	(1.6%)	(73.4%)	-
CYTOMEDIX INC	(18.4x)	(7.8x)	42.6x	(0.0x)	(0.5x)	(0.6x)	(1,112.3x)	(724.3x)	(16.4x)	(1,117.0x)	(794.3x)	(26.9x)	(86.8%)	-	1,317.6%
USG CORP	0.3x	0.2x	0.6x	0.8x	3.3x	1.5x	16.1x	4.2x	6.3x	14.2x	2.3x	4.2x	8.3%	3.4%	19.7%
FRIEDE GOLDMAN HALTER INC	0.3x	(0.9x)	(0.2x)	(44.2x)	(1.3x)	(0.5x)	(0.2x)	(6.2x)	(14.7x)	(1.4x)	(7.3x)	(15.8x)	15.5%	(59.0%)	-
PROTEONOMIX INC	(1.4x)	(2.4x)	(0.7x)	(2.2x)	(1.9x)	(4.7x)	(4.7x)	(10.3x)	(2.1x)	(4.7x)	(10.5x)	(2.1x)	(94.4%)	-	-
RADNET INC	0.1x	0.1x	(0.1x)	11.1x	5.6x	7.6x	1.0x	1.7x	1.3x	(0.0x)	0.7x	0.3x	-	-	-
AMERICAN WAGERING INCORP	(0.1x)	(2.1x)	0.1x	1.8x	2.0x	3.7x	4.9x	5.8x	3.9x	2.9x	3.5x	1.2x	(9.9%)	(83.9%)	(5.0%)
AMERCO	0.2x	0.0x	0.3x	24.7x	9.3x	7.8x	0.5x	1.2x	1.4x	(0.4x)	0.4x	(0.1x)	11.2%	(4.9%)	14.1%
WEIRTON STEEL CORP	(0.1x)	(0.5x)	0.1x	(5.2x)	(15.6x)	(3.4x)	(1.8x)	(1.4x)	(3.2x)	(3.2x)	(4.3x)	(6.7x)	-	-	-
RAHAXI INC	(0.2x)	(19.6x)	(8.9x)	(0.1x)	(0.4x)	(0.0x)	(412.8x)	(69.6x)	(163.9x)	(413.2x)	(77.6x)	(173.4x)	-	(1,957.1%)	(134.5%)
PRESIDENT CASINOS INC	(0.1x)	(0.3x)	0.3x	22.7x	8.0x	2.9x	0.3x	0.9x	2.3x	(0.2x)	0.3x	0.4x	-	-	-
NATIONAL STEEL CORP-CL B	(0.1x)	(1.0x)	(1.0x)	(9.5x)	(1.8x)	0.5x	(1.2x)	(6.7x)	15.3x	(3.9x)	(8.9x)	2.4x	(16.7%)	-	-
ZAP	(13.3x)	(7.5x)	(0.6x)	(0.1x)	(0.2x)	(1.3x)	(85.3x)	(199.7x)	(22.1x)	(102.2x)	(224.5x)	(25.5x)	(39.0%)	(254.5%)	(23.2%)
SOFTLOCK.COM INC	(13.3x)	(2.7x)	-	(0.1x)	(0.4x)	1.1x	(117.5x)	(18.1x)	11.1x	(127.2x)	(23.1x)	11.1x	(254.3%)	(121.6%)	-
HERBORIUM GROUP INC	(1.4x)	(1.2x)	(0.8x)	(7.1x)	(1.0x)	1.1x	(3.4x)	(14.7x)	20.6x	(5.3x)	(15.8x)	19.5x	(105.1%)	(108.6%)	(72.2%)
COMPOSITE TECHNOLOGY CORPORA	(12.4x)	(17.3x)	(2.8x)	(0.1x)	(0.1x)	(0.6x)	(239.8x)	(245.6x)	(15.9x)	(241.6x)	(254.8x)	(16.7x)	-	-	-
INTELLIGENT COMMUNICATION EN	(1.0x)	(1.3x)	(0.1x)	(0.5x)	(0.8x)	(10.7x)	(31.8x)	(12.1x)	(1.8x)	(35.2x)	(13.4x)	(1.8x)	(80.6%)	-	-
EPICUS COMMUNICATIONS GROUP	-	-	(0.3x)	(5.4x)	(0.4x)	(4.8x)	(2.4x)	(26.6x)	(3.2x)	(2.4x)	(26.6x)	(3.3x)	-	-	-
AIR INDUSTRIES GROUP INC	-	-	-	0.9x	(0.2x)	(23.9x)	10.0x	(51.7x)	(0.5x)	10.0x	(51.7x)	(0.5x)	-	-	-
NEWTON ENERGY CORP	-	-	-	(12.8x)	(7.2x)	(23.7x)	(1.2x)	(2.0x)	(0.8x)	(1.2x)	(2.0x)	(0.8x)	-	-	-
MEDIA 100 INC	(0.1x)	(0.3x)	(0.3x)	(10.8x)	(3.5x)	(3.2x)	(0.9x)	(3.2x)	(3.7x)	(1.5x)	(3.8x)	(4.4x)	(14.3%)	(35.3%)	(38.8%)
INTL THOROUGHBRED BREEDERS	0.0x	(0.3x)	(0.1x)	(25.9x)	(49.9x)	23.3x	(0.3x)	(0.1x)	0.3x	(0.7x)	(0.3x)	0.1x	(1.7%)	(25.5%)	-
MEDICAL STAFFING SOLUTIONS I	(0.8x)	(0.5x)	0.6x	0.3x	0.2x	(7.2x)	15.5x	31.9x	(2.6x)	15.5x	30.0x	(5.4x)	-	-	-
U.S. ENERGY SYSTEMS INC	(0.0x)	0.2x	(0.6x)	5.5x	89.8x	(5.7x)	1.5x	0.1x	(0.8x)	1.1x	(0.2x)	(1.0x)	(6.7%)	18.4%	(58.8%)
PILGRIM'S PRIDE CORP	0.4x	0.3x	0.9x	0.8x	(6.0x)	0.3x	17.1x	(2.1x)	10.8x	15.1x	(4.1x)	8.8x	6.2%	4.3%	12.0%
GBO INC	0.1x	(0.2x)	0.0x	(23.7x)	5.1x	(1.4x)	(0.4x)	2.1x	(15.2x)	(0.9x)	1.3x	(19.1x)	0.2%	(26.1%)	(5.4%)
PROLOGIC MANAGEMENT SYSTEMS	(0.2x)	(0.1x)	(0.1x)	(2.4x)	(4.5x)	(7.1x)	(5.3x)	(4.6x)	(4.8x)	(5.7x)	(4.6x)	(4.8x)	-	-	-
FACTORY 2-U STORES INC	0.1x	(2.9x)	(8.1x)	(1.4x)	(22.7x)	(36.0x)	(17.9x)	(1.2x)	(0.6x)	(29.5x)	(24.2x)	(10.0x)	(8.7%)	(95.9%)	-
SIRICOMM INC	(141.3x)	(0.8x)	(1.2x)	(0.0x)	(2.9x)	(3.7x)	(6,440.0x)	(0.9x)	(0.8x)	(6,460.0x)	(0.9x)	(0.8x)	-	-	(122.7%)
CHESAPEAKE CORP	0.3x	0.1x	0.2x	4.2x	6.0x	3.7x	2.7x	1.9x	2.1x	1.0x	1.0x	1.0x	8.7%	(0.1%)	3.6%
TELEMETRIX INC	0.0x	(3.3x)	0.4x	9.1x	7.0x	16.6x	0.8x	1.0x	0.2x	(1.2x)	(0.5x)	(1.3x)	-	-	-
PFF BANCORP INC	0.0x	0.0x	0.0x	11.8x	17.3x	9.6x	0.8x	0.5x	1.3x	0.7x	0.4x	1.2x	-	2.5%	2.8%
INTROGEN THERAPEUTICS INC	(1.2x)	(3.5x)	(2.5x)	(0.3x)	(0.5x)	(0.3x)	(42.1x)	(25.8x)	(28.9x)	(46.2x)	(29.8x)	(30.3x)	(30.0%)	(96.6%)	(81.9%)
BUTLER INTL INC	0.2x	0.1x	0.0x	22.1x	62.7x	5.9x	0.4x	0.2x	1.6x	0.2x	(0.1x)	1.3x	8.6%	3.8%	0.5%
MOTORS LIQUIDATION CO	0.4x	0.2x	(0.1x)	1.9x	2.8x	1.4x	7.8x	3.9x	4.0x	2.9x	1.0x	1.7x	5.9%	(6.1%)	(24.5%)
VISTEON CORP	0.6x	0.0x	0.2x	2.4x	4.2x	3.2x	5.1x	2.9x	25.3x	2.2x	(0.3x)	8.3x	37.4%	-	-
CAPITAL CORP OF THE WEST															
CIB MARINE BANCSHARES INC															
WALKING CO HOLDINGS INC/THE	(0.2x)	(0.1x)	(0.2x)	7.5x	(4.5x)	3.2x	2.0x	(3.3x)	3.4x	1.4x	(4.3x)	2.2x	(17.3%)	(10.6%)	(15.3%)
COOPER-STANDARD HOLDING	-	-	0.3x	6.8x	(581.1x)	1.6x	2.1x	(0.0x)	5.0x	2.1x	(0.0x)	2.8x	-	-	2.0%
LUNA INNOVATIONS INC	-	-	-	(1.4x)	(1.0x)	(3.7x)	(12.6x)	(16.1x)	(3.3x)	(12.6x)	(16.1x)	(3.3x)	-	-	-
MEDCOM USA	(0.6x)	(3.7x)	(20.7x)	0.7x	1.0x	0.1x	11.6x	8.4x	163.5x	(1.0x)	(4.6x)	(46.3x)	-	-	-
ASYST TECHNOLOGIES INC	(0.0x)	0.1x	0.1x	(4.4x)	7.9x	8.9x	(4.5x)	1.9x	1.7x	(7.8x)	(0.8x)	(0.8x)	(11.8%)	-	-
ABITIBIBOWATER INC	-	-	-	(9.2x)	(33.4x)	(2.8x)	(1.3x)	(0.2x)	(0.6x)	(1.3x)	(0.2x)	(0.6x)	-	-	-
GENERAL GROWTH PROPERTIES	0.0x	0.0x	0.0x	128.0x	(372.2x)	46.3x	0.1x	(0.0x)	0.4x	(0.0x)	(0.3x)	(0.2x)	-	0.9%	0.0%
HOWARD HUGHES CORP/THE	-	-	-	(0.8x)	(0.4x)	(9.8x)	(81.6x)	(104.2x)	(5.3x)	(81.6x)	(104.2x)	(5.3x)	-	-	-

APPENDIX 1 – American sample – Credit metric ratings and synthetic spreads

	FFO/Net Debt			Net Debt/Ebitda			Ebitda/Interest			Ebit/Interest			ROCE			Scoring			Blended rating			Spread		
Name	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1	FY-1	FY	FY1
SMC VENTURES INC	BBB	CCC	CCC	CCC	CCC	B	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	5.8	7.0	6.7	B-	D	C	5.5%	16.0%	5.5%
CYTOMEDIX INC	CCC	CCC	AAA	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	AAA	7.0	7.0	4.2	D	D	BB+	16.0%	16.0%	3.5%
USG CORP	BB	B	A	AA	BB	A	A	BB	BB	A	B	BB	CCC	CCC	A	3.7	5.6	3.5	BBB-	B-	BBB+	2.8%	5.5%	1.8%
FRIEDE GOLDMAN HALTER INC	BB	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	BBB	CCC	CCC	6.0	7.0	7.0	CCC+	D	D	7.0%	16.0%	16.0%
PROTEONOMIX INC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
RADNET INC	B	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	6.6	7.0	7.0	C+	D	D	13.0%	16.0%	16.0%
AMERICAN WAGERING INCORP	CCC	CCC	CCC	BBB	BBB	B	BB	BB	BB	BB	BB	B	CCC	CCC	CCC	5.6	5.6	6.3	B-	B-	CC+	5.5%	5.5%	10.0%
AMERCO	BB	CCC	BB	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	B	CCC	BBB	6.1	7.0	6.0	CCC	D	CCC+	8.5%	16.0%	7.0%
WEIRTON STEEL CORP	CCC	CCC	B	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	6.6	D	D	C+	16.0%	16.0%	13.0%
RAHAXI INC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
PRESIDENT CASINOS INC	CCC	CCC	BB	CCC	CCC	BB	CCC	CCC	B	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	5.5	D	D	B+	16.0%	16.0%	4.3%
NATIONAL STEEL CORP-CL B	CCC	CCC	CCC	CCC	CCC	AA	CCC	CCC	A	CCC	CCC	B	CCC	CCC	CCC	7.0	7.0	4.9	D	D	BB-	16.0%	16.0%	4.1%
ZAP	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
SOFTLOCK.COM INC	CCC	CCC	CCC	CCC	CCC	A	CCC	CCC	A	CCC	CCC	A	CCC	CCC	CCC	7.0	7.0	4.8	D	D	BB-	16.0%	16.0%	4.1%
HERBORIUM GROUP INC	CCC	CCC	CCC	CCC	CCC	A	CCC	CCC	A	CCC	CCC	A	CCC	CCC	CCC	7.0	7.0	4.8	D	D	BB-	16.0%	16.0%	4.1%
COMPOSITE TECHNOLOGY CORPORA	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
INTELLIGENT COMMUNICATION EN	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
EPICUS COMMUNICATIONS GROUP	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
AIR INDUSTRIES GROUP INC	CCC	CCC	CCC	A	CCC	CCC	BBB	CCC	CCC	A	CCC	CCC	CCC	CCC	CCC	5.0	7.0	7.0	BB-	D	D	4.1%	16.0%	16.0%
NEWTON ENERGY CORP	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
MEDIA 100 INC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
INTL THOROUGHBRED BREEDERS	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
MEDICAL STAFFING SOLUTIONS I	CCC	CCC	A	AAA	AAA	CCC	A	AAA	CCC	A	AAA	CCC	CCC	CCC	CCC	4.2	3.8	5.4	BB+	BBB-	B+	3.5%	2.8%	4.3%
U.S. ENERGY SYSTEMS INC	CCC	B	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	A	CCC	7.0	6.4	7.0	D	CC+	D	16.0%	10.0%	16.0%
PILGRIM'S PRIDE CORP	BB	BB	AA	AA	CCC	AAA	A	CCC	A	A	CCC	A	CCC	CCC	BB	3.7	6.2	2.1	BBB-	CCC-	A+	2.8%	9.0%	1.0%
GBO INC	CCC	CCC	CCC	CCC	B	CCC	CCC	B	CCC	CCC	B	CCC	CCC	CCC	CCC	7.0	6.5	7.0	D	CC	D	16.0%	11.0%	16.0%
PROLOGIC MANAGEMENT SYSTEMS	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
FACTORY 2-U STORES INC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
SIRICOMM INC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
CHESAPEAKE CORP	BB	CCC	BB	B	CCC	B	B	CCC	B	CCC	CCC	CCC	CCC	CCC	CCC	5.8	7.0	5.8	B-	D	B-	5.5%	16.0%	5.5%
TELEMETRIX INC	CCC	CCC	BBB	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	5.8	D	D	B-	16.0%	16.0%	5.5%
PFF BANCORP INC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
INTROGEN THERAPEUTICS INC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
BUTLER INTL INC	B	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	B	CCC	CCC	CCC	6.6	7.0	6.9	C+	D	C-	13.0%	16.0%	15.0%
MOTORS LIQUIDATION CO	BBB	B	CCC	BBB	BB	A	BBB	BB	BB	BB	CCC	B	CCC	CCC	CCC	4.3	5.8	5.4	BB+	B-	B+	3.5%	5.5%	13.0%
VISTEON CORP	A	CCC	B	BB	B	BB	BB	B	AAA	B	CCC	A	AAA	CCC	CCC	4.1	6.6	4.8	BB+	CC-	BB-	3.5%	12.0%	4.1%
CAPITAL CORP OF THE WEST																								
CIB MARINE BANCSHARES INC																								
WALKING CO HOLDINGS INC/THE	CCC	CCC	CCC	CCC	CCC	BB	B	CCC	B	B	CCC	B	CCC	CCC	CCC	6.8	7.0	6.2	C	D	CCC	14.0%	16.0%	8.5%
COOPER-STANDARD HOLDING	CCC	CCC	BB	CCC	CCC	A	B	CCC	BB	B	CCC	BB	CCC	CCC	CCC	6.8	7.0	4.5	C	D	BB	14.0%	16.0%	4.0%
LUNA INNOVATIONS INC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
MEDCOM USA	CCC	CCC	CCC	AA	A	AAA	A	BBB	AAA	CCC	CCC	CCC	CCC	CCC	CCC	5.0	5.4	4.5	B+	B+	BB+	4.3%	4.3%	3.5%
ASYST TECHNOLOGIES INC	CCC	B	B	CCC	CCC	CCC	CCC	B	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	6.5	6.6	D	CC	C+	16.0%	11.0%	13.0%
ABITIBIBOWATER INC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
GENERAL GROWTH PROPERTIES	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%
HOWARD HUGHES CORP/THE	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	7.0	7.0	7.0	D	D	D	16.0%	16.0%	16.0%

Source: Author

Appendix 2. Implied ERP

We have used the historical ERP approach for our empirical model as it is backward looking. For an estimation of a forward looking ERP (to be used in any Discount Cash Flow Analysis) it would not be sensible to use historical data and mean reversion. In this section, we introduce the Implied ERP approach for estimating forward looking ERPs. We briefly introduce 2 methods (Damodaran 2010):

DCF model based premiums

This model aims to estimate the ERP using a DDM model (Dividend Discount Model). In this model, the value of the equity is the PV of the future dividends. In the basic case where dividends grow at a constant rate, we derive to the popular Stable Gordon Growth Model (SGGM):

$$\text{Value of equity} = \frac{\text{Expected Dividends Next Period}}{(\text{Required Return on Equity} - \text{Expected Growth Rate})}$$

In this formula, the very unknown is the Required Return on Equity as the other values are a given. Hence, we can back out the Equity Risk Premium by subtracting the ROE from the RFA.

Another option to this method would be to use earning instead of dividends. To facilitate the transition, we follow Damodaran (2008) by stating the future growth rate in terms of the ROE and the payout ratio:

$$\begin{aligned}\text{Growth rate} &= (1 - \text{Dividends/ Earnings})\ (\text{Return on equity}) \\ &= (1 - \text{Payout ratio})\ (\text{ROE})\end{aligned}$$

We then substitute back into the SGGM and we derive to:

$$\text{Value of equity} = \frac{\text{Expected Earnings Next Period (Payout ratio)}}{(\text{Required Return on Equity} - (1 - \text{Payout ratio})\ (\text{ROE}))}$$

By assuming the ROE is equity to the COE (Cost of Equity) meaning there is no excess return, the equation comes down to:

$$\text{Value of equity} = \frac{\text{Expected Earnings Next Period}}{\text{Required Return on Equity}}$$

And hence, the required ROE would be:

$$\text{Required return on equity} = \frac{\text{Expected Earnings Next Period}}{\text{Value of Equity}}$$

As Damodaran points out, this is the inverse of the PE ratio and it becomes the required return on equity for companies in stable growth earnings. Again, we can infer the ERP by taking the RFA off the required ROE:

$$\text{Implied premium (EP approach)} = \text{Earnings Yield on index} - \text{Riskfree rate}$$

Default Spread Based ERP

This method attempts to quantify the ERP in terms of default spread on corporate bonds. If we follow Damodaran (2008) and we track the Baa default spread over the RFA and the US ERP since 1960, the ERP would be 2.x the default spread (2.2% and 4.4% respectively). The median works out at 2.02x approximately. Then the ERP could be calculated as:

$$\text{Equity Risk Premium} = \text{Default Spread} * \text{Median ratio or ERP/Spread}$$

Appendix 3. ERP Analysis: main US and European indices

DDM Model - No CRP	S&P		FTSE		CAC		DAX		IBEX	
	Dividends + Buybacks	Growth %	Dividends + Buybacks	Growth %	Dividends + Buybacks	Growth %	Dividends + Buybacks	Growth %	Dividends + Buybacks	Growth %
Year										
2011	50		321		206		351		635	
2012	50	0.5%	328	2.2%	211	2.2%	356	1.4%	770	21.1%
2013	52	4.9%	346	5.7%	222	5.4%	372	4.6%	800	3.9%
2014	55	4.8%	368	6.2%	235	5.6%	393	5.5%	818	2.3%
Terminal value - >2014	56	2.0%	375	2.0%	239	2.0%	401	2.0%	835	2.0%
Index -Current level	1,162		5,171		2,871		5,545		7,850	
Expected ROE	9.2%		12.7%		14.5%		12.9%		16.9%	
Current RFA (US)	2.0%		2.0%		2.0%		2.0%		2.0%	
Implied ERP	**7.2%**		**10.7%**		**12.5%**		**10.9%**		**14.9%**	

DDM Model - CRP	S&P	FTSE	CAC	DAX	IBEX
Std Dev Index 06/11	11.6%	11.8%	16.8%	14.4%	22.0%
Std Dev US / Std Dev Country		1.0x	1.4x	1.2x	1.9x
Implied ERP	7.2%	7.3%	15.4%	15.6%	20.6%
US RFA		7.2%	7.2%	7.2%	7.2%
Country Risk Premium (CRP)		**0.1%**	**8.2%**	**8.4%**	**13.4%**

Source: Author

BLOCK2

SECTION 1

1 Introduction

The aftermath of the "credit crunch" in 2008, the biggest credit crisis since the Last Depression, prompted regulators to adopt new measures to avoid another fall out of the financial system and hence of the entire world economy. During the financial turmoil, governments across the world deployed mounting public funds to rescue ("bail-out") the so called "too big to fail (TBTF)" banks to avoid the systematic risk[71] that the failure of a financial institution could trigger across the globe. The failure of Lehman Brother and the subsequent collapse of the financial system and the world trade proved the need to prop up TBTF to minimize the market panic and shore up the financial system. When Lehman Brothers filed for bankruptcy, capital markets seized up and the interbank market dried up preventing banks from relying on the short term funding, the common funding for investment banks, consequently creating a significant shortfall of cash that forced banks such as Merrill Lynch, or Bear Stearns to be rescued to big commercial banks such as Bank of America or JP Morgan. Others such as Goldman Sachs or Morgan Stanley were forced to seek the rescue from the government[72], temporarily becoming commercial banks.

In Western Europe we witnessed big subprime and real estate intensive banks such as HBOS, Lloyds, RBS, Rabobank, West LB or ING seeking government support after big losses coming from their investment banking units. The "bail-out" of these banks was financed through public money (or let us say through tax payers' money). The governments were forced to deploy thousands of billions for these banks to avoid the collapse of their local financial system and the knock-on effects on the global financial system.

The TBTF's "bail-out" has given rise to significant criticism due to the intrinsic moral hazard of the banking business. Banks are highly levered holding structures that have traditionally taken on a fair amount of risk to boost the return on equity and meet shareholders' expectations through investments in high risky instruments[73]. A short period of credit widening, equity markets sell-off, or a drop in housing prices to name a few can bring down a highly levered and weak capitalized bank if the capital structure is non-loss absorbing enough to withstand these events. If banks face any serious liquidity or solvency problem, they are confident that the governments will step in and recapitalize them to avoid the systematic risk of a bank fall-out.

But this has to come to an end. The regulators cannot afford to let the system collapse again. There is so much at stake. During the last three years we have witnessed the pernicious effects of a banking crisis in terms of failing banks and companies, job destructions, or house repossessions that has taken the developed economies to a severe period of recession and sluggish growth. The risk reward in the banking sector has been traditionally unbalanced as bankers have always relied on the government as the last resort in the event of a shortfall of liquidity or solvency. In the meantime, bankers go on with their risky investments as they take the governments support for granted[74].

Going forward, any investor in a bank will run the risk of losing money. Basel III is here to make sure of that. There will be "burden sharing" between equity and debt holders or, in other words, across the

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[71] And intensifying the "moral hazard" in banking.

[72] Through the TARP funds.

[73] Subprime mortgages, LBO financing, real estate developers, etc

[74] The fall of TBTF institutions such as Lehman has devastating effects on the economy and on the financial banking system and the regulator has learned the lesson.

entire capital structure. Bankers will decide where to invest but if they seek high yields through high risky investments, solvency rules will be stringent with them and they will have to allocate more capital to support these investments. Basel III's goal is to rationalize the banking system and do away with the intrinsic flaws of the banks: high leverage, duration mismatch due to its yield curve strategy[75], reliance on short term liquidity, excessive risk and the absence of a loss absorbing capital structure beyond the common equity.

The most important implementation of Basel III is the loss absorbing capital structure. The Basel II capital structure has proved to be weak to absorb short term shocks due to the lack of dilution/write down features. Only the common equity has been used to absorb losses. Basel II capital structure is made up of "hybrids" instruments, equity like instruments which have actually played out more as debt instruments given their lacking of "going concern"[76] features in the event of losses.

Basel III aims for a "bail-in" (losses taken up by debt and equity holders) rather than "bail out" (losses taken up by taxpayers) capital structure. Basel III seeks for "burden sharing" across the entire capital structure (including senior debt and deposits) on a "going concern" basis rather than on a "gone concern" basis. Public money will only be available once the bank has reached the point of non-viability and the entire capital structure has been written down ("haircut") but the bank is still viable. Enough "bail-in" instruments in the capital should avoid the need of public funds. Probably, a bank that reaches a point of non-viability due to significant losses will be wounded up so no public money will ever be needed again.

The new Basel III hybrids instruments will probably display a CoCo (Contingent Conversion) style of characteristics through either principal write down or equity conversion.[77] This is the contractual way to impose losses in the capital structure. However, it is possible through Special Resolution Regimes that regulators could "haircut" some layers of the capital structure via statutory rules even though these instruments do not have loss absorbing features in the bond documentation.

Basel III endeavors to instill solvency discipline across the banking system. To address the solvency ratio, Basel III aims to force the banks to increase and bolster their Core Tier 1 ratios to higher levels to beef up the amount of tangible equity in the balance sheet. Additionally, to shore up the rest of the capital structure, Tier 1 ratios[78] should have compliant loss absorbing instruments according to a specified trigger to backstop losses and avoid the so called point of non-viability where the regulators steps in, impair ("haircut") the capital structure through a liability management process to fix the balance sheet and leave the bank on a "going concern" basis.

Basel III is also concerned with the liquidity and the duration mismatch, It has proposed several key ratios to make sure banks are liquid in both the short and the long run:

- Liquidity Coverage Ratio to ensure that the banks hold a sufficient buffer of unencumbered high-quality assets to survive an acute stress scenario lasting for one month.

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[75] Borrowing in the short end of the curve and lending on the long end.

[76] We will elaborate on that but Basel III aims to have a "going concern" capital whereby a viable bank experiencing losses might impose writedowns or dilution on debt holders on a "going concern" basis rather than on a "gone concern " basis (most of current hybrids instruments are only written down on a winding up scenario).

[77] After a particular trigger (a minimum Core Tier 1 is breached), a CoCo should experience a writedown of 20% or converted into equity at a price already set in advance.

[78] Core Tier 1 + preferences shares and hybrid instruments.

- Net Stable Funding Ratio establishes a minimum amount of stable funding based on the liquidity characteristics of an institution's assets and activities over a one-year horizon[79].

Overall, the new Basel III rules will have a strong impact of the cost of capital in banks (Ineke 2011). Under the "burden sharing" framework, the capital structure will become loss absorbing. This will increase the price of the instruments as the banking debt investors will be exposed to potential losses. This will increase the risk premium demanded by the investors which will feed through to the entire capital structure boosting the overall cost of capital of the banks (WACC). The WACC of the banks has always been overlooked[80] by the market due to the easy and cheap accessibility of funding for the banks and hence the market has been more inclined to focus on the COE as the equity was the only loss absorbing layer in the capital structure. From our view, going forward both the market and the banks will have to pay more attention to the overall cost of capital of the bank due to the sharp upward repricing of the capital structure. This is one of our first goal in our empirical analysis. We aim to measure the impact of the new regulatory framework on the overall cost of capital in the banks.

Additionally, investors should calibrate the impact of potential losses in a bank that bring solvency below a threshold that trigger the loss absorption through the capital structure. This is our second goal: assess the cost of the capital structure pre and post regulatory event that triggers the CoCos (Contingent Conversion)[81] into equity.

Thirdly, we conduct a valuation exercise by looking at the evolution of the share price, shares count, ROE and equity multiples per bank on a pre and post conversion basis. Through this exercise, we will observe the movements in the equity valuation across the CoCos conversion period.

2. Capital adequacy in banks

The bank related solvency regulation is currently articulated through the Basel II rules even though the banking industry is now gearing up to meet the new Basel III rules. Basel III, has already published several guidelines that lays down the potential capital structure for banks and the minimum solvency ratios.

The goal of bank regulators is to protect the depositor and provide a stable environment for banks to operate in. In order to be authorized as a bank and take deposits, an institution has to hold adequate capital. The regulator places limits on the proportions and type of capital allowed to make up a bank's capital base. A weighting framework is used to quantify various kinds of risk and a required capital ratio is set, which may be higher than the minimum ratio.

2.1 Basel II capital structure

Capital adequacy requires not just a certain quantity of capital but certain types in relationship to the nature of a bank's assets. Under Basel II, these types are called Tier 1, Tier 2 (Upper and Lower) and Tier 3 Capital along with the Core Tier Equity that form the regulatory capital structure of the banks. We describe each capital layer to understand the nature of the solvency ratios.

[79] See appendix 5 for a better understanding.

[80] Or at least not taken into account when pricing the equity of the banks (as opposed to corporates where WACC is a key driver in valuation).

[81] We use CoCos as our preferred loss absorbing Basel III instrument.

- Core Tier Equity or Core Tier 1 (CT1): It is the purest equity layer in the capital structure. It is made up of the ordinary shareholders' equity + retained earnings + reserves and share premium account + available for sale reserves (AFS) + minorities[82].

- Tier 1 (T1): CT1 + perpetual non-cumulative preferred stock / bonds (known as "Tier 1"). The main characteristics of T1 bonds are:
    - Perpetual and senior only to equity.
    - Coupons are deferrable and non-cumulative.
    - Interests and principal can be written down.

- Tier 2 (T2): T1 + perpetual deferrable subordinated debt (Upper Tier 2 bonds-UT2) + revaluation reserves from fixed assets and fixed asset investments + general provisions up to a maximum of 1.25% of risk weighted assets + dated subordinated debt with a minimum maturity of five years (Lower Tier 2 bonds-LT2) + any perpetual debt with no loss absorbency features or interest deferral provision. Tier II cannot exceed 50% of Tier I (and hence Tier II<Tier I). The main features of the UT2 and LT2 are:
    - UT2:
        - Perpetual and senior to Tier 1 and equity.
        - Coupons are deferrable and cumulative.
        - Interests and principal can be written down.
    - LT2:
        - Subordinated only to senior debt.
        - No deferral of coupons and no write down of principal and interest.
        - Dated with minimum maturity of 5 years.

- Tier 3 (T3): Tier 1 + Tier 2 + dated subordinated debt with a minimum of two years. The main characteristics of Tier 3 are:
    - Dated with a minimum maturity of 2 years.
    - Rank pari passu with LT2.
    - Both interest and principal can be deferred due to regulatory "lock in" clause if the capital ratios fall below a threshold.

- Capital ratio (BIS ratio) is the overall capital ratio and is the sum of CT1+T1+T2+T3

Banks must make some deductions to their total levels of capital in order to avoid regulatory pitfalls such as double counting of capital (Morgan Stanley 2010). The main deductions are:

- Core Tier 1 and Tier 1: goodwill[83] and intangibles; treasury stock
- Tier 2: investments in unconsolidated subsidiaries and associates; connected lending of a capital nature, including guarantees; all holdings of another bank's capital over a maximum of the equivalent of 10% of a bank's eligible Tier 1 and Tier 2 capital base.

The solvency ratios are set as a ratio of capital to risk weighted assets (RWA). The RWA scales the notional of the risk position. It is intended to proxy the riskiness of the underlying position. The RWAs are computed in three components (the so called "three pillars"):

[82] These arise when a bank has a subsidiary that it does not wholly own.

[83] It arises when a bank buy another company for a price above its book value.

- Credit risk: capital held against the risk of entity specific losses on positions (equities and credit) held in the banking book and or the counterparty (CP) risk[84].
- Market risk: risk of losses arising from movements in the market prices of positions held in the trading book.
- Operational risk: capital held against the risk from failed internal processes, people, systems, or external events.

The capital ratio defines how much capital has to back each unit of RWA.

Under current Basel II regulations, the capital ratio is set at 8% and the majority of this capital (at least 4%) must be Tier 1 capital. These ratios just represent the regulatory minimum. In reality, banks usually manage much higher ratios[85].

However, Basel II has proven to be weak to withstand big shocks and this weakness has been highlighted by the crisis. Following Goldman Sachs, the main critics are:

- Capital base too small and Tier 1 bonds have not proven to be very loss absorbing.
- Pro-cyclicality of the economic cycle not addressed.
- Systemic risk not appropriately captured.
- Significant jurisdictional differences exist in the capital definition.

2.2 Basel III capital structure

As we have pointed out above, Basel III seeks to force banks to bolster solvency by holding "purer" equity and larger capital buffers going forward. The capital structure will be more transparent and uniform across the different jurisdictions. Basel III recalibrates to three capital ratios:

- A minimum common equity (CT1) ratio of 4.5%.
- A minimum Tier 1 capital ratio (T1) of 6%.
- A minimum total capital ratio (BIS) of 8%.

Nonetheless, as we will discuss below, these ratios will come in at higher levels due to additional buffers and market standards.

Following Goldman Sachs (2010), the new Basel III rules aim at:

- Dampen cyclicality by building up capital buffers in periods of growth.
- Protect the banking sector from periods of excess credit growth.
- Potential additional benefit moderating loan growth during bubbles.
- Decreased systematic risk in the banking system.
- Build up capital buffers before distributed earnings.
- Make the capital structure more loss absorbing / "bail-in" oriented.

Some capital instruments (particularly the T1 bonds) have been found to be insufficiently loss absorbent during the crisis and the opaque capital base of the banks coupled with large discretion left to individual jurisdictions prompted the "bail-out" of banks by the states.

[84] That effectively covers the counterparty risk of derivative positions.

[85] In fact, in the aftermath of the crisis, market turned to the Core Tier 1 as opposed to the Tier 1 to calibrate the solvency position of the banks and the market standards guided to the a minimum Core Tier 1 between 8%-10%.

Therefore, the new rules seek to improve the quality of the capital base, instil better loss absorption characteristics for Tier 1 and Tier 2 instruments and increase the reporting and disclosure. Thus,

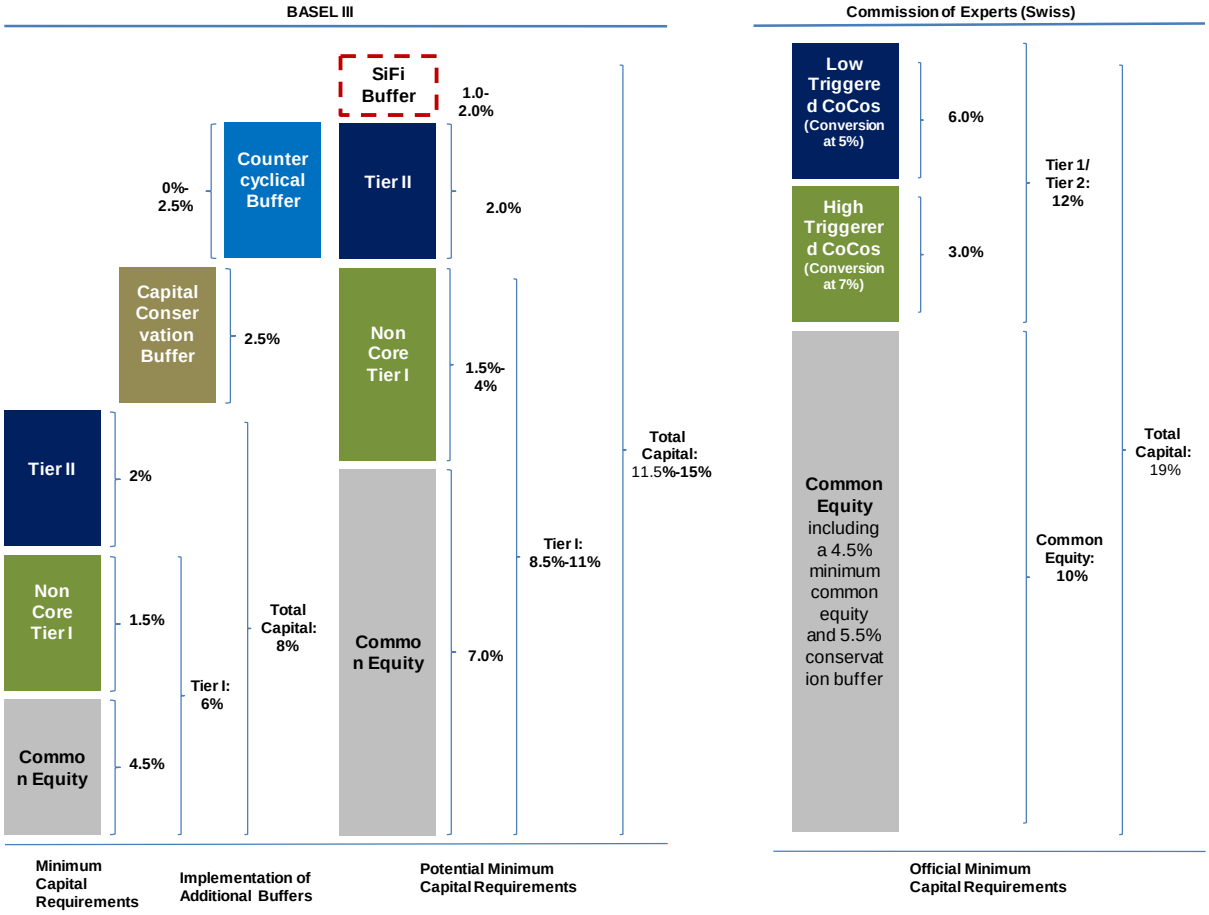
- CT1 will be made up of common equity and retained earnings but certain regulatory adjustments will be substracted[86].
- T1 instruments must be loss absorbing on a "going concern" basis[87].
- T2 is harmonized into a single bucket meaning no distinction between UP2 and LT2.
- T3 is removed from the capital structure.

Below the Minimum Basel III Capital ratios (including the buffers) laid out by the Basel Press Release (12 Sep 2010) and the mandatory capital structure issued by the Commission of Experts (FINMA) for the Swiss Banks .

[86] See appendix III but these include goodwill and other intangibles, defined pension fund assets, some minority interests, investments in other financial institutions above certain limits, some deferred tax assets above certain limits and mortgage servicing rights above certain limits.

[87] Meaning the bank does not go into liquidation.

Figure 1: Basel III vs Swiss Capital Structure



Source: author

As far as Basel III is concerned, the minimum requirement for common equity will be raised from the current 2% level, before the application of regulatory adjustments, to 4.5% after the application of stricter adjustments. The Tier 1 capital requirement, which includes common equity and other qualifying financial instruments, will increase from 4% to 6%. The capital conservation buffer above the regulatory minimum requirement be calibrated at 2.5% and be met with common equity[88]. A countercyclical buffer within a range of 0% –2.5% of common equity or other fully loss absorbing capital will be implemented according to national circumstances. This buffer will only be in effect when there is excess credit growth that is resulting in a system wide buildup of risk. The countercyclical buffer, when in effect, would be introduced as an extension of the conservation buffer range. Systemically important banks (SiFi) should have loss absorbing capacity beyond the standards announced. The Basel Committee is developing a well-integrated approach to systemically important financial institutions which could include combinations of capital surcharges, contingent capital and "bail-in" debt. Therefore, the total capital ratio could go as high as 15% for the main core European banks (Henriques 2010).

As for FINMA, the Swiss regulator imposes higher requirements than those of Basel III due to the "Too Big to Fail" problem given the size of UBS and CS 'assets versus the Swiss GDP (600% Assets / GDP) . In summary, the Swiss regime will require the large banks to have a minimum Core Tier 1 ratio

[88] Restrict discretionary distributions (dividends and bonuses) when the bank's capital level is close to a minimum.

(CT1) of 10% (4.5% minimum common equity and 5.5% of conservation buffer). On top of this, the Swiss banks should hold an additional capital cushion of 9.0% of contingent convertible securities (3% of RWAs with a 7% CT1 trigger and 6.0% of RWAs with a 5% CT1 trigger[89]). The total capital ratio amounts to 19%, roughly 400bps higher than the highest potential capital ratio under Basel III.

Basel III has explicitly given strong emphasis to the core equity relative to the hybrids instruments (even more the Swiss regulator). However, we believe that the hybrids will definitely contribute to meet higher regulatory capital requirements. We are confident that the Basel III hybrids can turn out to be very cost effective in terms of loss absorption and a non-dilutive way to comply with the minimum Basel III capital standards. The introduction of additional buffers to the minimum required capital will increase the importance of the loss absorbing hybrid instruments in the overall capital structure of the banks. As mentioned above, there are basically three capital buffers set at the discretion of the regulator and in line with the proportion of the bank's assets relative to the GDP:

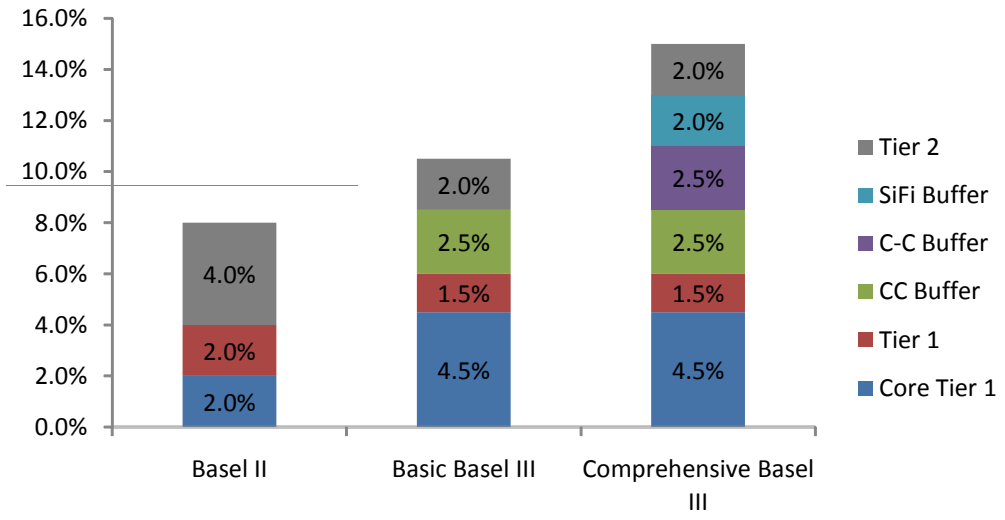
- The Capital Conservation buffer (CC) to build up capital outside periods of stress that can be drawn upon as losses are incurred.
- The counter cyclical buffer (C-C) which could be in the region between 0%-2.5% to build up in periods of excess credit growth.
- The SIFI (Systematic Important Financial Institutions) between 0%-2%.

We believe that these two buffers could be filled through "loss absorbing" Basel III compliant instruments. This will definitely raise interest among the bank community to tap these instruments as they will allow not only to meet the minimum capital requirements but they will turn out a cost-effective and non dilutive way to support shareholder returns.

Below, we compare three different capital structure namely Basel II, Basic Basel III and Comprehensive Basel III. The latter includes our estimation of the three aforementioned buffers.

[89] In practice, we would regard the 3.0% of high trigger securities as a form of "going concern" capital and the 6.0% of low trigger securities as a form of "gone concern" capital.

Figure 2: Basel Capital Structure Comparison



Source: author

On that basis, the proportion of non-Core Tier 1 instruments (effectively Basel III compliant instruments) could increase from 33% to 53% by adding loss absorbing hybrid capital to meet the regulatory buffers. We can observe that despite the proportion of non-Core Tier 1 instruments being lower than the maximum levels of Basel II (75%), on absolute terms the 8% level of non-Core Tier 1 would be higher than that of Basel II. Therefore and contrary to market perception, the overall amount of hybrids in Basel III could much higher than in Basel II, even though it will depend on the levels of additional buffers imposed by the regulators.

Proportion of Basel III compliant instuments

	Basel II		Basic Basel III		Comprehensive Basel III	
	%	Cost	%	Cost	%	Cost
Core Tier 1	2.0%	25.0%	7.0%	66.7%	7.0%	46.7%
Non Core Tier 1	6.0%	75.0%	3.5%	33.3%	8.0%	53.3%

Source: author

2.2.1 Grandfathering: managing the capital structure

Basel III will have a meaningful impact in the capital structure of the banks. The new rules promote "bail-in" mechanisms (as opposed to "bail-out" or tax payers rescue money) whereby the capital structure of the banks has to hold instruments with loss absorption features, no incentives to call, no step up coupons etc. Basel III aims to make the CoCos type of instrument more equity than debt like. Below a summary of the new requirement for both Tier 1 and Tier 2 instruments:

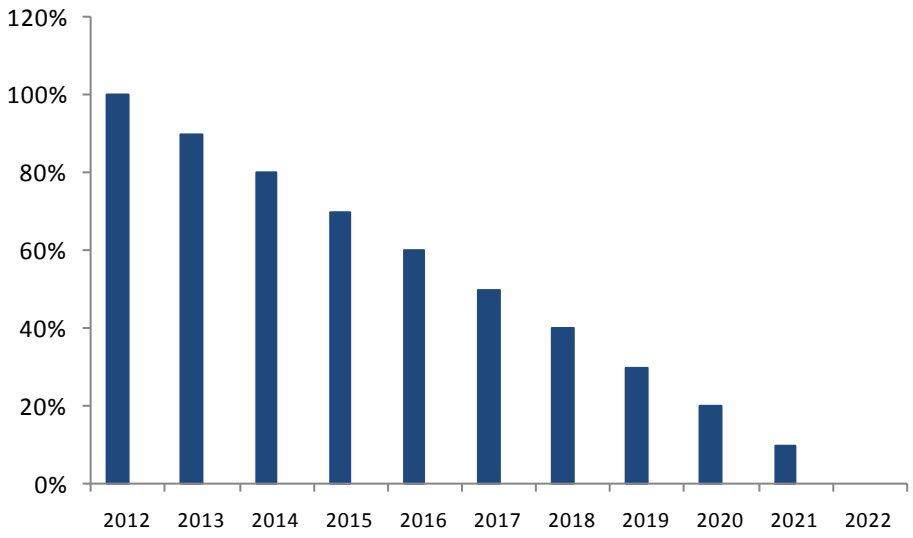
	Tier 1	Tier 2
Seniority	Junior subordinated	Subordinated
Maturity	Perpetual	Original maturity of 5 years minimum
Incentive to redeem	No step - ups	
Callable	After 5 years, with supervisory approval	
Replacement	With capital of the same or better quality	
Payments	Full discretion at all times to cancel distributions/payments	
Loss absorption	Principal (going concern & non viability)	Principal (non viability)

Source: author

According to Basel III Committee guidelines, hybrid instruments that no longer qualify as Tier 1 or Tier 2 will be phased out from January 1st 2013. This is implemented by determining the overall amount of non-eligible instruments outstanding as of January 1st 2013, which serves as a starting point to estimate the maximum grandfathering threshold for such instruments. Grandfathering means that for a period of time, non-compliant regulatory hybrids instruments will still be accounted for as regulatory capital but they progressively lose out their eligibility until they are finally phased out.

The maximum threshold for the grandfathering of non-eligible instruments is set at 90% for 2013 and then is progressively reduced by 10% each year (Calamaro 2011).

Figure 3 : Basic of grandfarthering



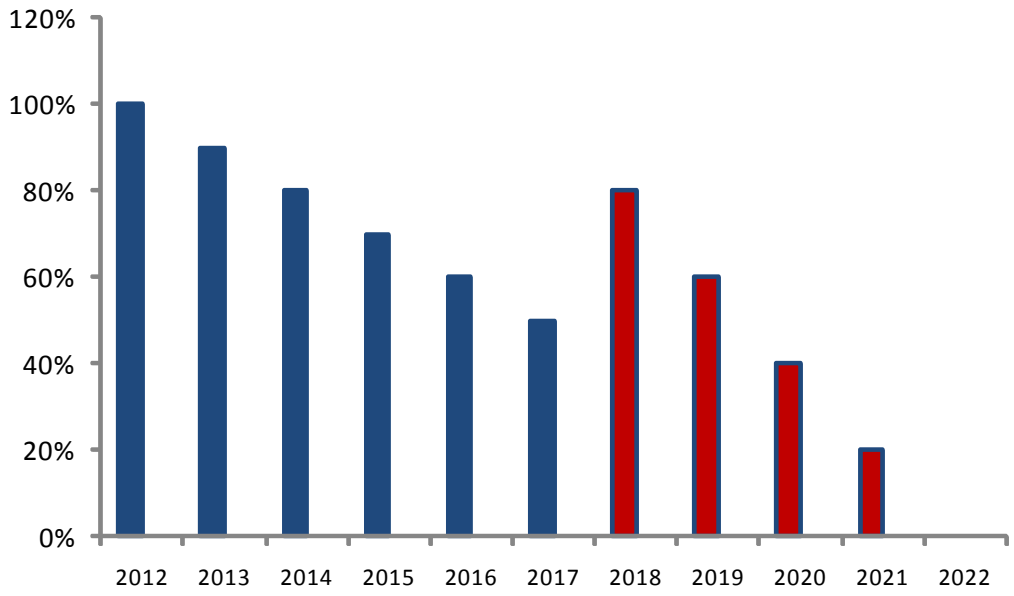
Source: author

For example, this T1 bond will be 100% accounted for regulatory capital in 2012 to decrease by 10% (ie 90%) in 2013 and so on until it is phased out in 2022.

It must be noted that Lower Tier II hybrids have a different amortization profile given the fact that these instruments are subject to specific regulatory amortization through the last 5 years to maturity.

From January 2013 on until first call date[90], these instruments will fall within the bucket of non-compliant instruments and they will be amortized by 10% annually until their first call date. Once the call date is passed, these instruments will become eligible again but become subject to their own specific guidelines on regulatory amortization, which is usually 20% annually over the next 5 years to maturity.

Figure 4: LT2 Grandfathering and Regulatory Amortisation



Source: author

Below the grandfathering rules under Basel III for the stock of hybrids bonds (Citigroup 2010).

		General Basel III criteria met		
		YES		NO
		Loss absorbency at non viability point		
		YES	NO	
No step up	Issued before 12 September 2010	Recognition continues	Phase-out	
	Issued after 12 September 2010		Phase-out	Full de-recognition from Jan 2013
Step up	Issued before 12 September 2010	Recognition continues	Phase-out	Phase-out
	Issued between 12 September 2010 and January 2013			Full de-recognition from Jan 2013
	Issued after 1 January 2013	Phase-out then back to full recognition from call date	Phase-out then full de-recognisition on call date	

Source: author

[90] Call date means that the bond can be redeemed at the discretion of the issuer at a par or make whole at a specified date contractually set out.

We do not aim to extend on this topic as it is out of the scope of this thesis but we would like to make a few remarks. Basel III entails a thorough revision of the capital structure by banks. The latter will have to manage the capital accordingly to benefit from the grandfathering period but also to keep their solvency ratios (CT1, TI and TII) in line with the required buffers set out by Basel III. Since non-compliant hybrids instruments will progressively phase out, banks will have to evaluate their options in terms of grandfathering, calls, new CoCos issuances etc. There are not only capital costs but also opportunity costs embedded in this process (Ineke 2011):

- Between Tier I and Tier II as the former have more stringent rules, banks can leave Tier I as Tier II outstanding if the coupon of the Tier I is lower than what the bank could be paying for a new style of Basel III-compliant Tier II bonds. [91]
- Between using or not the existing stock of hybrids to access the new Basel III hybrid market. Bank should start levering off the existing investor base to avoid being the last in the queue when the market ramps up.
- Lastly, the opportunity cost of greater premiums on future hybrids issuances if issuers do not meet investor's expectations in terms of calling the existing instruments. [92]

2.2.2 Special Resolution Regimes

These are currently country regulatory frameworks whereby the regulator can impose losses on banking debt securities even if the bond documentation does not include any loss absorbing feature via write down or equity conversion[93]. At the moment, there are only fully operational resolution regimes in UK, Ireland, and Denmark but European Commission is striving to implement them across the entire European space. Therefore, there are two ways to impose losses on debt holders: either through contractual clauses (the bond documentation contemplates loss absorption in the event of a particular trigger[94]) or through statutory powers (regulator imposes losses at the point of non-viability or when the solvency is stretched). This has a significant impact on non-loss absorbing hybrids instruments which were supposed to phase out owing to their lack of write down features. Through resolution regimes, these instruments become "burden sharing" with the equity holders in the event of losses by statutory rules even though the documentation does not state so. Therefore, the banks will manage their capital structure under the assumption that resolution regimes are implemented which will have a significant impact on the banks 'call strategies.

For example, a low coupon non loss absorbing Tier 1 hybrid of a bank domiciled in a special resolution regime country might be left outstanding as Tier II after the call date (call not exercised) as the requirements of Tier II under Basel III are laxer than those of Tier 1 (see table above): subordination, minimum initial maturity of 5 years and have additional loss absorbency features which will be provided by the special resolution regime.

3. Theoretical framework for the average cost of regulatory capital for banks

The following framework of minimum capital requirements allows us to estimate the impact of the new Basel III on the average cost of regulatory capital in banks. An increase in the cost of capital is the

[91] As long as the Tier I bond is still compliant with other Basel III criteria (non step up, loss absorption or there is a resolution regime in this country). See next section.

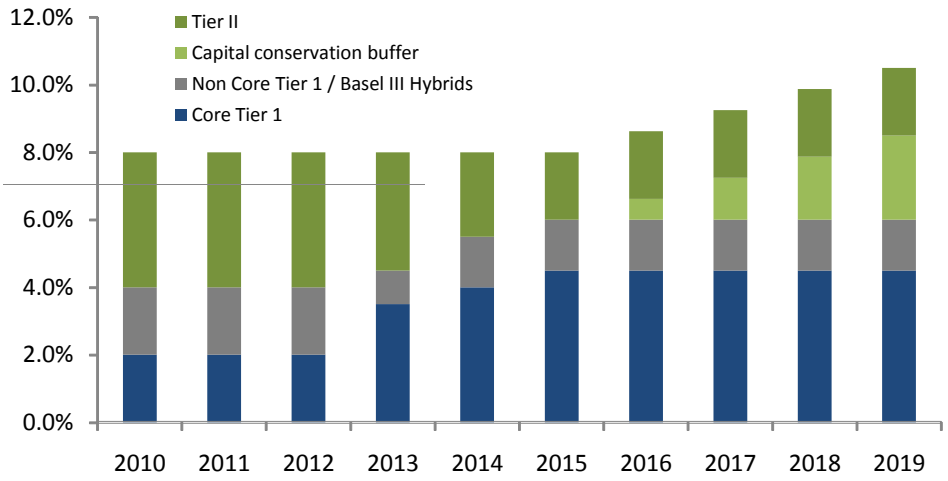
[92] There are reputational purposes at stake as banks have traditionally call the bonds at first date and reason why bonds usually trade on call in the secondary market.

[93] As it has happened in Ireland with the three major banks: Bank of Ireland, AIB and Anglo Irish bank.

[94] Core Tier 1 falling below a particular level; the bank approaching the point of non-viability, etc.

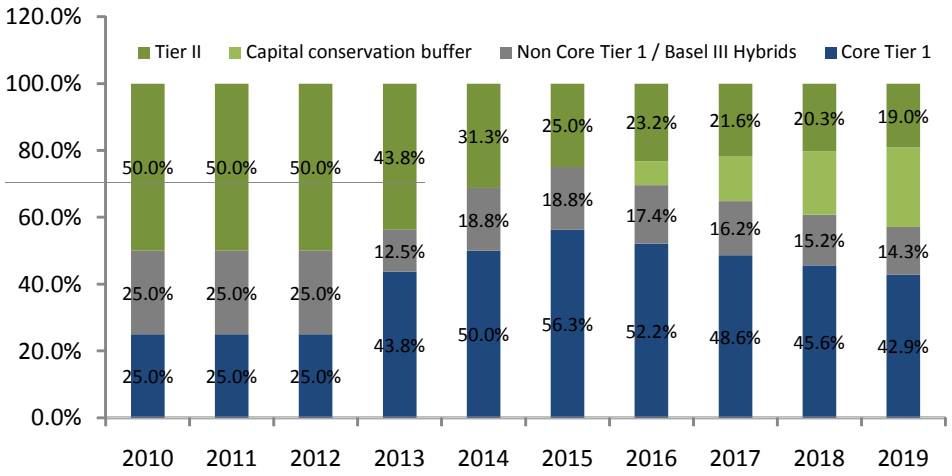
most immediate impact for the European banking sector given the requirement to maintaining a higher proportion of core equity in the capital structure as well as loss absorbing capital instruments. To quantify the impact on the cost of capital of a solvent bank, we use the phasing in of the new capital requirement set out by Basel III (Henriques 2010). Our underlying assumption is that the bank keeps its solvency ratios in line with the minimum requirements. However, we presume most of the banks will aim to maintain higher than required ratios to enjoy some headroom and flexibility and to comply with some other requirements (systematic or "too big to fail" banks, high beta banks etc).

Figure 5: Minimum Capital Requirements Under Basel III



Source: JP Morgan Research team and author

Figure 6: Bank Capital Structure Under Basel III



Source: JP Morgan Research team and author

Given the Basel III guidelines set out above and assuming a theoretical COE for a bank along with the estimated Basel III (Tier I and II) compliant instruments cost, we can graph the evolution of the cost of capital as the minimum capital requirements are phased in through 2019. Bear also in mind that we have made also an assumption on the expected cost of capital for the new Basel III hybrids which will

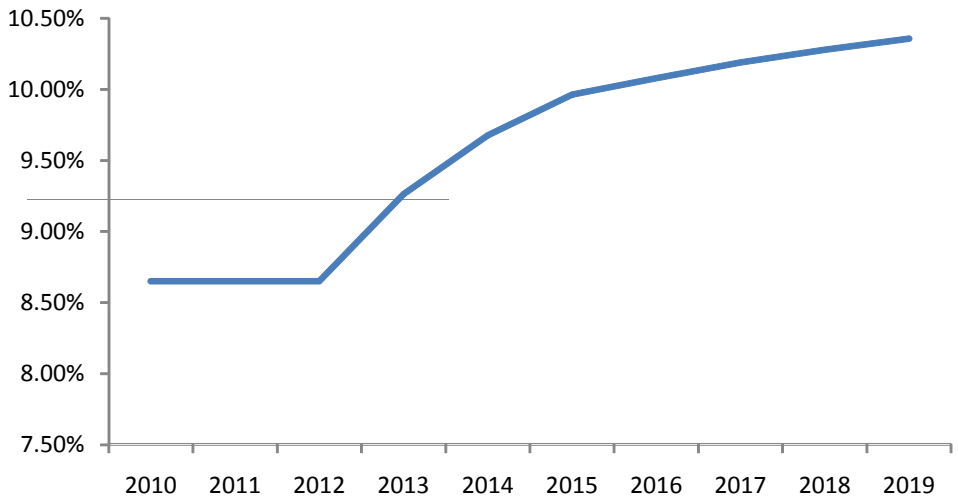
be determined by the risk embedded in the instrument[95] and the issuer. We must note that the "bail-in/point of non-viability" optionality of the Tier II as laid out by the August 2010 Consultation paper by the Basel Committee on Banking Supervision will materially add to the overall cost of capital of the bank.

We estimate the shift in the average cost of regulatory capital (ACRG) by looking at above figure which shows the proportions of each component within the capital structure and the below table which shows the average cost of regulatory capital. For example, we see the ACRG increasing from 8.65% in 2010 to 9.96% in 2015 to finally 10.36% in 2019 if the bank complies with the minimum required capital levels per component. We must note that if our Basel III compliant instrument cost of capital is too low[96] and turns out to be at 9.5% for the Tier I and 7.5% or higher for the Tier II, the overall cost of capital for the hybrids will start converging to the COE.

	Core Equity		Tier I		Tier II		
	%	Cost	%	Cost	%	Cost	ACRG
2010	25.0%	11.6%	25.0%	9.0%	50.0%	7.0%	8.65%
2011	25.0%	11.6%	25.0%	9.0%	50.0%	7.0%	8.65%
2012	25.0%	11.6%	25.0%	9.0%	50.0%	7.0%	8.65%
2013	43.8%	11.6%	12.5%	9.0%	43.8%	7.0%	9.26%
2014	50.0%	11.6%	18.8%	9.0%	31.3%	7.0%	9.68%
2015	56.3%	11.6%	18.8%	9.0%	25.0%	7.0%	9.96%
2016	59.4%	11.6%	17.4%	9.0%	23.2%	7.0%	10.08%
2017	62.2%	11.6%	16.2%	9.0%	21.6%	7.0%	10.19%
2018	64.6%	11.6%	15.2%	9.0%	20.3%	7.0%	10.28%
2019	66.7%	11.6%	14.3%	9.0%	19.0%	7.0%	10.36%

Source: author

Figure 7: Increase in he ACRG



Source: author

[95] In terms of "high" or "low" trigger point.

[96] We have used the newly issued CoCos (Credit Suisse, Rabobank, Unicredit) as a benchmark but by all means the cost levels could well be higher in the future.

We must also highlight that our ACRG framework does not fully capture the increase in the average cost given that the final outcome will be driven by the absolute minimum capital requirements and the issuing cost of the Basel III compliant instruments. Our framework only shows the impact on the ACRG by assuming some proportions and the cost for each capital component. Below, we run a sensitivity table to assess the ACRG under different Tier I and II cost assumptions. Under a very aggressive scenario where both Tier I and II display strong "bail-in/point of non-viability" and assuming a cost of 11% for the former and 8% for the latter, the ACRG will trend towards the COE. This analysis shows the magnitude of the move of Basel III compliant instruments costs on the ACRG (Henriques 2011).

		Tier II cost						
		5.5%	**6.0%**	**6.5%**	**7.0%**	**7.5%**	**8.0%**	**8.5%**
Tier 1 Cost	**7.0%**	9.78%	9.88%	9.98%	10.07%	10.17%	10.26%	10.36%
	7.5%	9.86%	9.95%	10.05%	10.14%	10.24%	10.33%	10.43%
	8.0%	9.93%	10.02%	10.12%	10.21%	10.31%	10.40%	10.50%
	8.5%	10.00%	10.09%	10.19%	10.28%	10.38%	10.48%	10.57%
	9.0%	10.07%	10.17%	10.26%	**10.36%**	10.45%	10.55%	10.64%
	9.5%	10.14%	10.24%	10.33%	10.43%	10.52%	10.62%	10.71%
	10.0%	10.21%	10.31%	10.40%	10.50%	10.59%	10.69%	10.78%
	10.5%	10.28%	10.38%	10.48%	10.57%	10.67%	10.76%	10.86%
	11.0%	10.36%	10.45%	10.55%	10.64%	10.74%	10.83%	10.93%

Source: author

We estimate that the European banks will definitely see their ACRG significantly increasing given the historical reliance on cheap hybrids funding[97]. As underscored above, our theoretical analysis is very sensitive to the absolute amount of capital, therefore, if any bank is legally bound to hold a higher core equity or overall capital levels (such as the Swiss banks"), the ACRG will markedly increase. Consequently, the ACRG is driven by the absolute quantity of regulatory capital and the average cost of each component within the capital structure. In our empirical analysis, we will look at the capital structure pre and post losses and we will evaluate the ACRG under the scenario of CoCos triggering.

4. Understanding the CoCo Value

As outlined above, during the credit turmoil, most of the banks had no "going concern" loss absorbing capital structures to absorb losses beyond the equity. Despite some Tier 1 instruments being contingent on capital ratios, regulators in general struggled to have coupons suspended on most hybrids instruments whose purpose would be to serve as a cushion against a potential default. As a consequence, regulators have started to think through new instruments with mandatory write downs or equity conversions feature if the CT1 falls below a certain threshold. These instruments are called Contingent Convertible Bonds (CoCos). In other words, it is a debt instrument which could be impaired (either written down or converted into equity) upon a regulatory event, preferably CT1 falling below a minimum threshold.

4.1 The CoCo concept and typology

A CoCo bond is a bond which is converted into equity at a predetermined strike price (SP) in the event of solvency trigger. The CoCo can be thought of an option (put) bought from the bondholder by

[97] As opposed to the US ones given the reliance on the expensive "Trust preferred instruments".

the issuer such that upon a regulatory event[98] (CT1 falling below a threshold), the option is exercised and the bondholder receives equity for its bond at a predetermined price (SP). If the share price at the trigger date is X, then the bondholders loses the difference between the strike and the current share price (SP-X)/SP% and received the balance, X/SP% in equity (Goldman Sachs 2010).

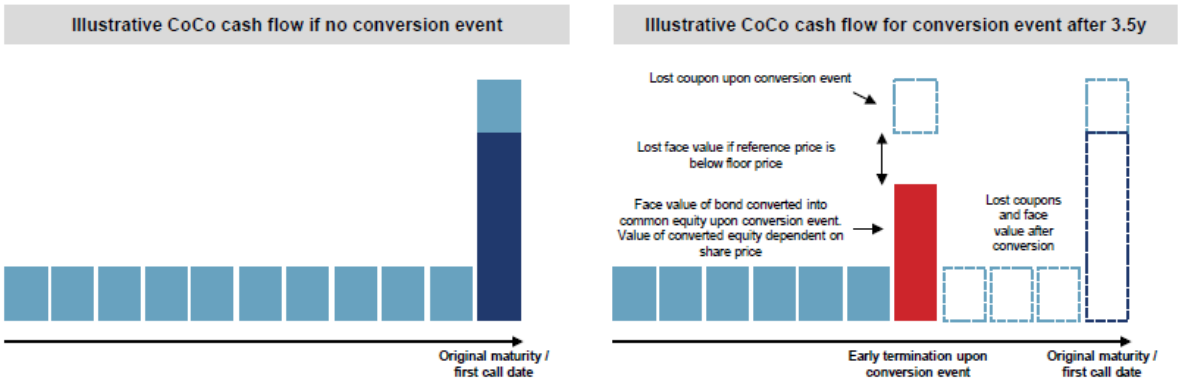
Consequently, a CoCo is made up of two components:

- An amount (SP-X)/SP% that gets written down to zero upon a trigger.
- An amount X/SP% that experiences an equity conversion.

If the strike price is equal to the conversion price, then the write down is zero (X-X/X) and the initial amount is converted into equity.

Below an overview of the CoCo's cash flows if and if no conversion event happens. We can see in the second graph the loss in coupons and face value after the conversion trigger.

Figure 8: Overview of CoCos's Cash Flows



Source: Credit Suisse Research team

At the moment there are several Tier I and Tier II loss absorbing bonds in the market but significantly differ from the contingent capital based instruments of Basel III and SIMMA. Below a comparison between the CoCos and the Tier I and II instruments. We can see the difference between the Low CoCos (trigger at 5%) and Tier 2 bonds as "gone concern" instruments whose "bail-in "features kick in after the "going concern" instruments (High CoCo / Tier 1 bonds) are converted or written down. Needless to say as we go down the capital structure, the instruments become more expensive for the banks.

[98] Or at the point of non-viability (see 4.4.4.1).

	Instrument	Maturity	Ranking	Coupon Suspension	Going Concern loss absorption	Gone Concern loss absorption
Gone concern instruments absorbing losses after Tier and High CoCos	**Low CoCo at 5% CT1 trigger**	Dated	`Tier 2	None	None	Yes, conversion at 5% CT1
	Tier 2 (conversion / write down)	Dated	`Tier 2	None	None	Yes, permanent principal write down or conversion into equity
Going concern loss absorbing instruments	**High CoCo at 7% CT1 trigger**	Dated	`Tier 2	Yes	Yes, conversion or permanent write down at 7% CT1	None
	Tier 1 (conversion / write down)	Perpetual	Tier 1	Non cumulative	Yes, temporary write down of principal; mandatory cancellation	Yes, permanent principal write down or conversion into equity

Source: author

Over the last three years several CoCos based instruments have been issued in Europe. The first one was the LT2 of Lloyds which was issued to allow the bank to meet the 2010 stress tests. Rabobank's CoCo was meant to replenish the weak CT1 of the bank. The most recent CoCos as of today is the Tier II Credit Suisse (CS) CoCo upon which we will base our empirical analysis as it best captures the main features of future CoCos market.

	Lloyds*	Rabobank	UniCredit	Intesa SanPaolo	Rabobank	Credit Suisse
ISIN	XS0459090188	XS0496281618	XS0527624059	XS0545782020	XS0583302996	XS0595225318
Announced	3 Nov 2009	12 Mar 2010	14 Jul 2010	23 Sep 2010	17 Jan 2011	14 Feb 2011
Coupon	9.125%	6.875%	9.375%	9.50%	8.375%	7.875%
Coupon Suspension	No	No	Yes, non-cumulative	Yes, non-cumulative	Yes, non-cumulative	No
Maturity	15 Jul 20	19 Mar 20	Perpetual	Perpetual	Perpetual	24 Feb 2041
Senior Debt Rating	A1/A/AA-	Aaa/AAA/AA+	Aa3/A/A	Aa2/A+/AA-	Aaa/AAA/AA+	Aa2/A/AA-
Issue Rating	Ba2/BB/BB	-	Baa3/BBB/BBB	Baa1/BBB+/A	-/-/A	-/-/BBB+
First Call Date	NA	NA	21 Jul 20	1 Jun 16	26 Jun 16	2016
Equity Conversion or Write-down	Conversion	Write-down	Write-down	Write-down	Write-down	Conversion
Write-back	NA	No	Yes	Yes	No	NA
Issue Amount	£147.6mm*	€1.25bn	€500mm	€1bn	$2bn	$2bn
Priority	Lower Tier 2	Senior	Tier 1	Tier 1	Tier 1	Tier 2
Method of issuance	On Exchange	Primary Market	Primary Market	Primary Market	Primary Market	Primary Market
Coupon Reset	NA	NA	3m EURIBOR + 749bps, on 21 Jul 20	5y EUR CMS + 757bps, on 1 Jun 16	5y UST + 642.5bps, on 1 Jun 16	MMSW + 522bps, on 24 August 2016 and every 5y after
Regulatory Capital Call	Yes	No	Yes at any time	Yes, on or after 1 Jan 13	Yes, prior to first call date	Yes, at any time
Regulatory Capital Call Price	Par + Accrued Interest	NA	Par + Accrued Interest	102% of original principal + accrued interest	Par + accrued interest	At 102% of original principal + accrued interest
Trigger for write-down/conversion	Core Tier-1 capital / RWA < 5%	Equity Capital / RWA < 7%	Total Capital Ratio < 6%	Total Capital Ratio < 6%	Equity Capital / RWA < 8%	Core Tier-1 capital / RWA < 7%
Relevant Ratio at 1H2010	Core Tier-1 Capital 9%	Equity Capital Ratio 13.5%	Total Capital Ratio 12.74%	Total Capital Ratio 12.2%	Equity Capital Ratio 13.5%	Core Tier-1 Capital 11.4%
Extent of write-down	NA	75% principal write-down with 25% cash recovery	To the extent necessary to enable issuer to continue to carry on its activities in accordance with applicable regulatory requirements	To bring the total capital ratio above the minimum requirements (currently 8%)	To the extent necessary so that Loss Absorption Event is no longer occurring	NA
Price of conversion	£0.592093	NA	NA	NA	NA	Greater of USD 20 (Floor Price) or prevailing market price or CHF 0.04 (translated into USD at prevailing exchange rate)

Source: Credit Suisse Research team

As we can see in the table, there are many different types of CoCos: a more debt like CoCo such as the Rabobank with principal write down or a more equity like option such as the Lloyds one which converts into equity at a fixed price or the CS's one that converts based on an average share price.

4.2 The conversion price

In our opinion, the conversion price structure of the CoCo will be a key factor of the investor appetite for this asset class. There are several options for that. The strike price can be set at the point of conversion (like the CS's CoCo) or at the spot price upon issuance (Lloyds's ECN) benefiting the bondholders in the former and the shareholders in the latter. Following Roberto Herniques of JP Morgan, we think that the best way of setting the strike is to tie the conversion price to the underlying solvency trigger[99] or in other words, to link the solvency to the equity valuation. Let us look at the pros and cons of each alternative (Ruback 1998).

4.2.1 Conversion strike price at the point of conversion

This is optimal for bondholders but suboptimal for shareholders.

Description	-The conversion strike is not pre-defined and only determined at the point where the option is triggered. - If we assume the trigger point is consistent with an acute share price fall, the conversion is done at distressed levels.
Bondholder	- The bondholder achieves a material equity stake as the conversion is triggered at distressed levels. -The bondholder could experience no loss on the notional as the delivered equity can be sold to recoup the notional invested. -The bondholder could enjoy a potential upside on the equity as the conversion (done at distressed levels) could support the issuer as a "going concern" and strengthen market confidence on the issuer. Thus, we expect some share price appreciation after the conversion.
Stockholders	- Shareholders incur in losses through strong dilution. - Shareholders might become minorities in an outcome that resembles a corporate restructuring. - Shareholders could use pre-emptive rights to mantain their equity stake to minimize the cost of dilution.
Comments	- From our point of view, this option clashes with the intended loss sharing framework for the subordinated debt under Basel III as losses for sub-holders are smoothed. - The requirement for the institution to have to fail for the CoCo bondholder to share in losses is suboptimal and undermines the principle of these instruments as "going concern" capital. - One of the benefits of this option is that shareholders' interests are more aligned with a more conservative corporate strategy which minimises the

[99] If the CT1 requires a 50% reduction to reach the trigger level, then the strike price could be determined at 50% below the spot price at issuance.

	probability of the instruments triggering.

4.2.2 Conversion strike price at the point of issuance

This is suboptimal for bondholders but optimal for shareholders (R. Henriques 2010).

Description	-The strike of the conversion option is pre-defined as the spot share price at the point of issuance.
Bondholder	- The bondholders has the same downside risk profile as that of shareholders given the conversion is done at the issuance price. - The bondholder is at the expense of the interest of the shareholders. - This is due to the fact that the conversion into equity at pre-determined price will result in less shareholder dilution than an emergency rights-issue at a distressed level.
Stockholders	- The shareholders benefit as the strike price at the point of issuance mitigates the potential dilution of a distressed equity cash call. - Shareholders benefit from a lower degree of dilution due to the fact that they have effectively 'locked in' a forwards rights issue at a very advantageous level.
Comments	- Bondholders would not enjoy much say in corporate strategy and after conversion would most likely remain minorities in the shareholding given that CoCos will tend to have outstanding notional value which is proportionally less than core equity, as per the Basel III proposed minimum capital requirements. - This option would be the approach which regulators feel more at ease with given that the loss profile of the instrument would tend to mimic that of a long stock position, hence being more in line with the loss absorbing philosophy of Basel III.

4.2.3 Conversion strike price linked to the solvency ratio

We share JP Morgan's view that an intermediate approach between these two is warranted in terms of defining the strike price of CoCo. Under this option, we establish a link between credit and equity as we assume that there is a relationship between the solvency levels of a bank and the stock price. Therefore, the strike price should be determined as a function of the loss required to bring down the solvency ratio (CT1) to trigger the CoCo. According to JP Morgan Equity Research there is empirical evidence[100] that suggests a correlation between the drop in solvency and the fall in share price. By doing so, we establish a more balance risk-reward structure for both bondholders and shareholders.

We follow this methodology in our empirical work.

[100] They did for UBS and RBS and there was high correlation between solvency and share price.

4.3 The CS CoCo

From our view, the CS's CoCo kick-starts the Basel III compliant Contingent Convertible market and set outs a precedent for future issuances. Due to its comprehensiveness, we use it to describe some other theoretical features of this instrument. Furthermore, we use the CS's style of CoCo for our empirical analysis.

CS has been the first in using a fully convertible High Trigger CoCo to comply with the stringent capital ratios of the Swiss regulator. Below we can see the main features.

Summary of Credit Suisse CoCo terms and conditions*	
ISIN	XS0595225318
Currency	USD
Maturity	24 February 2041, unless called or converted
Coupon	7.875% p.a. fixed coupon for first 5 years After 5 years, Mid-market swap level + 522bps with mid-market swap level reset every 5 years
Interest Dates	Semi-annual payments in arrears
Callability	At discretion of the issuer ■ If no conversion has happened ■ At First Optional Redemption Date or any interest date thereafter
First Optional Redemption Date	24 August 2016
Conversion	Mandatory conversion into ordinary shares in case of either a Contingency Event or a Viability Event
Contingency Event	Core Tier-1 ratio below 7%
Viability Event	At discretion of FINMA (Swiss Regulator) to protect Credit Suisse from insolvency or in case it receives extraordinary support from the public sector
Conversion Price	■ Number of shares delivered upon conversion equal to principal amount divided by Conversion Price ■ Conversion Price equal to the greater of – Reference Market Price on 5th day prior to conversion notice: average VWAP over 30 preceding business days (Asianing), translated into USD at the prevailing exchange rate – Floor Price – The nominal value of each share (currently CHF 0.04) translated into USD at the prevailing exchange rate
Floor Price	USD 20
Priority	Tier 2

Source: Credit Suisse Research team

CS's CoCo has very clear trigger points. Should the CT1 of the bank falls below 7% (or if the regulator considers the bank to be close to hit the 7%), the CoCos is triggered to replenish the CT1 up to a reasonable level set out by the regulator. In case of a contingency event, the CoCo will be converted into an amount of shares which is equal to its face value divided by the reference share price converted into US dollars (USD) at the prevailing exchange rate. The reference share price is the average VWAP over the 35th to 5th day prior to the triggering event). If the USD equivalent reference price is below USD 20 ("Floor Price"), the amounts of share to be delivered will be the face value divided by the Floor Price (FP). Thus, the main risk that the CoCo holder faces is that the CoCos is converted when the share price in USD is lower than FP (Goldman Sachs 2010).

4.3.1 Implied conversion probability in the CoCo

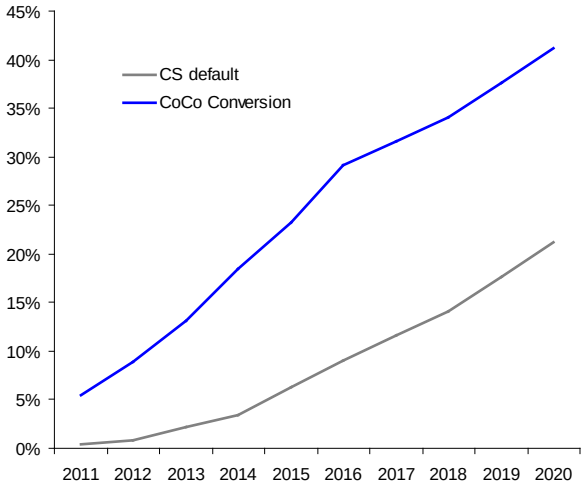
The trigger event in a CoCo is similar to the default of a regular bond because the bondholder receives cash or shares. For the CoCo in general and for CS's CoCo in particular we can estimate the implied probability of conversion by looking at the market price. Using CS's CDS and an assumed recovery, we can estimate the theoretical price of one of its regular bonds. The price is equal to the sum of the discounted cash flows weighted by the probability of being received.[101]

[101] Can be calculated from CS's CDS.

However, this calculation can turn out different to the market price of the bond. For instance, if the bond market price is lower, then the bond is cheaper than CS's CDS. We can account for this cheapness by working out the spread to be added to the discount rates to make the theoretical price equivalent to the market price. This is the so called bond's funding spread[102].

If we look for a regular bond of CS with the same maturity as that of the CoCo, the funding spread is 15bps (the bond is 15bps cheaper than the CDS). Using this reasoning for our CoCo, we find a funding spread of 265bps, much higher than the 15bps funding spread of the regular bond, meaning a higher probability of default than that of a regular bond. Since the funding spread calculation relies on probabilities of default, the CoCo seems to be cheap. If we increase the CDS spread used in the calculation of the CoCo funding spread, we lower the funding spread until matches the 15bps spread of the regular bond. Consequently, we can calculate the implied conversion probability for the CS CoCo. If the conversion occurs, CoCo holders receive CS shares which are equal to the principal divided by the strike price conversion. If we assume CS share price as at 30th April 2011 ($45) and the conversion price at the floor price ($20), the share price gives an assumed recovery of 44% for the CoCo (calculated as (100/$20 per share*$20 per share).

Figure 9: Cs's CpCo's Recovery



Source: author

Additionally, we can break down the compensation for CoCo's conversion risk into:

Total compensation = compensation if conversion occurs and issuer defaults + compensation if conversion occurs and issuer does not default

We expect both parts of the equation to carry a risk premium over historical experience according to DB. If we look at our sample of banks in our empirical analysis, none of them have defaulted in their senior debt. Following DB, this allows us to link the implied conversion probability to the historical conversion probability over a period (Spick 2011):

*Implied conversion probability = implied default probability + k*historical breach probability*

[102] Negative funding spread meaning that the bond is more expensive than the issuer's CDS.

In this formula, the historical breach probability hinges on the distance to trigger the CS' CoCo which is now 5.2% versus 1.6% back in 2008. The k variable in the equation indicates the compensation that the CoCo provides as a multiple of the historical experience.

Distance to trigger

	CS
CoCo Price	103.13
YTC	7.04
YTM	7.62
Z-spread	394.4
CT1 trigger	7.0%
Current CT1	12.2%
Distance	5.2%
Dec 2008 level	8.6%
Distance	1.6%

Implied to historical prob. Ratio

	Recovery %	To Call	To Maturity
	45	2.1	1.3
	20	1.5	1.2

Source: author

We compute the value to call and to maturity using current and an alternative recovery assumption. In both scenarios and for both the call and the maturity date, the k remains above 1x meaning the CoCo compensates well for a breach probability being higher than the historical observation.

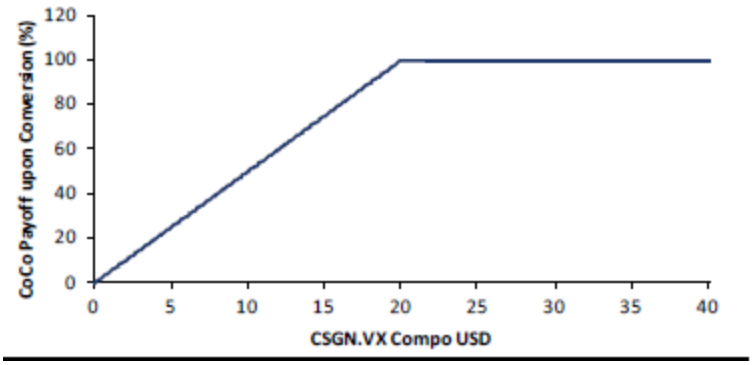
4.3.2 Hedging the CoCo

The value of the CoCo can be protected from potential losses by hedging it with American Put options with the strike price at the Floor Price.[103] However, one particular feature of the CS CoCo is that the bond is USD denominated but the shares are listed in CHF (they are referenced at CSGN.VX) having the floor price set at USD 20. Therefore, the option chosen for hedging purposes needs to take the foreign exchange effects into consideration. A hedging solution could be an American Put Option compo USD on CSGN.VX struck at USD 20[104].

The payoff upon conversion event resembles a short put option.

[103] It is an American option as the conversion can happen at any point in time as opposed to the European option (only at maturity).

Figure 10: CoCo's Hedging



Source: Goldman Sachs Research team

4.3.3 The Value in CoCos coupons

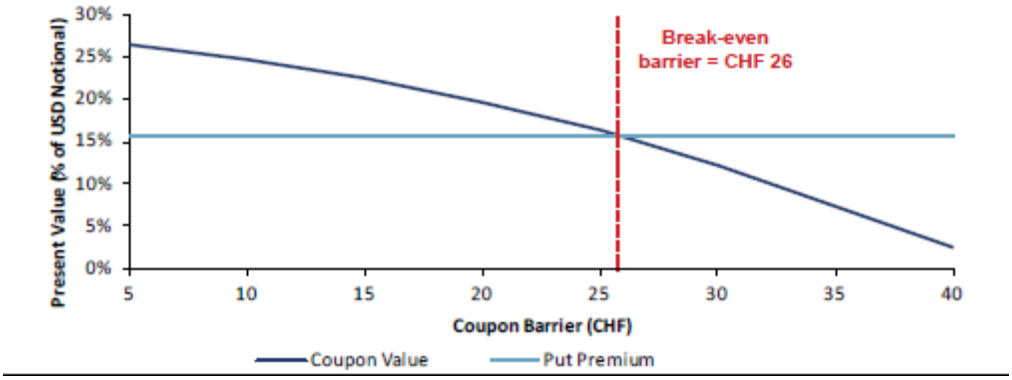
In our opinion, the CoCos bonds are compelling due to the attractive coupon relative to the conversion risk. The coupon of 7.875%, which is paid semiannually, represents a 5.30% excess over the 5.5y USD Libor (2.58%). This coupon can be then viewed as a stream of 2.65% semi-annual payments. This cash flows stream can be modeled as a strip of coupons with a knock-out[105] if the CS's share price hits USD 20[106]. Though the knock-out event is actually contingent on a breach of the CT1 ratio, we model it as an equity-linked down & out coupon (Saunders 2002).

Therefore, we can see the CoCo coupons similar to barrier options. If we set the barrier level at CHF 20, the value of the contingent coupons' excess spread over Libor for the first 5.5yr equals to 19.7% of the notional. A more aggressive assumption would be to place the barrier at 30% of current market levels (= CHF 13.00). In this case the contingent coupons' excess spread over Libor is worth 23.4%. In both cases the value of the down & out coupons is significantly higher than the value of the put that is needed to proxy-hedge the face value of the CoCo bond (15.7% premium spend* for compo USD American put option struck at USD 20) . At a premium of 15.7% it takes between 2.5 and 3 years of excess coupon payments to earn back the premium spend on the put option

[105] Which causes to lose the coupon stream.

[106] Given the CoCo can be modeled as a long position in a strip of down & out coupons and a short position in a put, the CS CoCo has a negative vega meaning that both the implied and realized volatility of CS is expected to increase when the share price goes down.

Figure 11: CoCo's Put Premium



Source: Goldman Sachs Research team

4.3.4 Relative value of the CoCo versus LT2

First thing that springs to mind when evaluating the CoCos value is how the risk adjusted return of it stacks up to those of other subordinated debt such as the LT2. Is the CoCo investor adequately compensated for the risk of conversion relative to a credit event?

To answer that question, we compare the z-spread[107] of a CS LT2 bond with subordinated CDS protection to the z spread of the CoCo hedged with put options. Under both scenarios, only the coupon is at risk allowing for a fair comparison of compensation between the probabilities of a conversion event versus a credit event (price levels are as of March 2011):

- LT2 + CDS: CS has currently two USD LT2 bonds outstanding: a 2018 6% bond and the 2020 5.4% bond. The z spreads are 190bps and 193 bps respectively. The 5y sub CDS trades at 138bps (negative basis) meaning that the spread earned on this strategy is 52bps.
- CoCo + Put: the CoCo bond currently trades at a z spread of 474bps. The 5.5 year American put option compo USD costs 15.7%, which is equivalent to a 301bps per annum. Therefore the spread comes out at 173bps.

Therefore, the ratio between both spreads implies that the probability of conversion is more than three times the probability of a credit event.

On a perpetual non call bond basis, CS has a 10 USD 5.860% floater T1 that currently trades at a z spread to call of 275bps versus the 474bps z spread of the CoCo.

4.4 Current debates on the CoCo space

4.4.1 The scale of the CoCo market

The importance of the CoCo market cannot be take for granted as these instrument will allow banks to comply with newly enhanced capital requirement under Basel III and run down progressively the existing non compliant Tier I and II. Therefore, the CoCo instrument has to be feasible in terms of structure and pricing to seek the support of the investor community given the potential issuance magnitude of these instruments.

[107] The constant spread that will make the price of a security equal to the present value of its cash flows when added to the yield at each point on the spot rate Treasury curve where a cash flow is received. In other words, each cash flow is discounted at the appropriate Treasury spot rate plus the Z-spread.

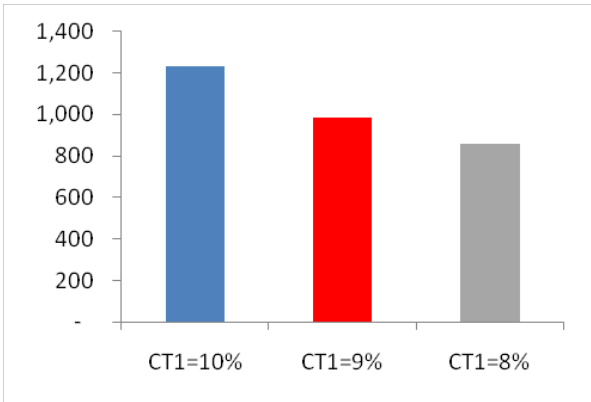
In estimating the scale of the potential issue of Basel III CoCo we rely on the absolute size of the core equity of the European banks. We also assume that the normalized CT1 for these banks will range between 8%-10% and on top of that, the aforementioned capital buffers. We also assume the overall capital ratio will be set at 12%-13%. As a result, we lay out three scenarios to estimate the potential Coco market by looking at three different potential capital structures under Basel III:

	Scenario I	Scenario II	Scenario III
CT1	8.0%	9.0%	10.0%
Tier I	1.5%	1.0%	1.0%
Tier II	3.0%	2.5%	2.0%

Source: author

Under these scenarios, and using the aggregate RWA of the entire European banking sector at the end of 2010, we estimate a CoCo market between €856bn-€1,200bn. Therefore the size of the hybrid market will be far larger than that of Basel II. The magnitude of this market reinforces the need to design an "investable" hybrid framework to allow these banks to issue these instruments to comply with the minimum capital requirements.

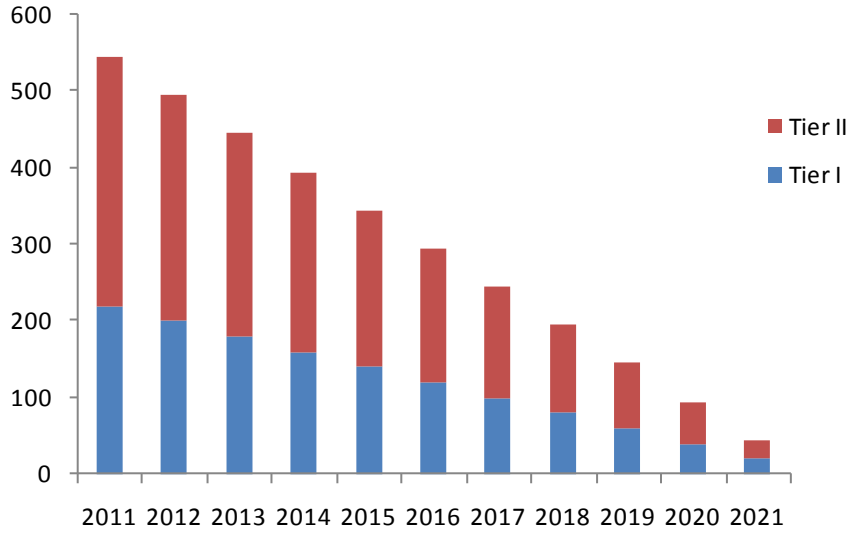
	Basel II	CT1=10	CT1=9%	CT1=8%
Assets	33,550			
Liabilities	31,450			
Equity	2,100			
Capital Structure				
Core Tier 1		2,065	2,317	2,569
Tier I		428	302	302
Tier II		806	680	554
Total potential CoCos		**1,234**	**982**	**856**
CoCos / Capital		37%	30%	25%



Source: author

According to JP Morgan, the importance of the hybrid market is exacerbated when looking at the amortization profile of the current Tier I and Tier II instruments, which are phasing out progressively through 2020.

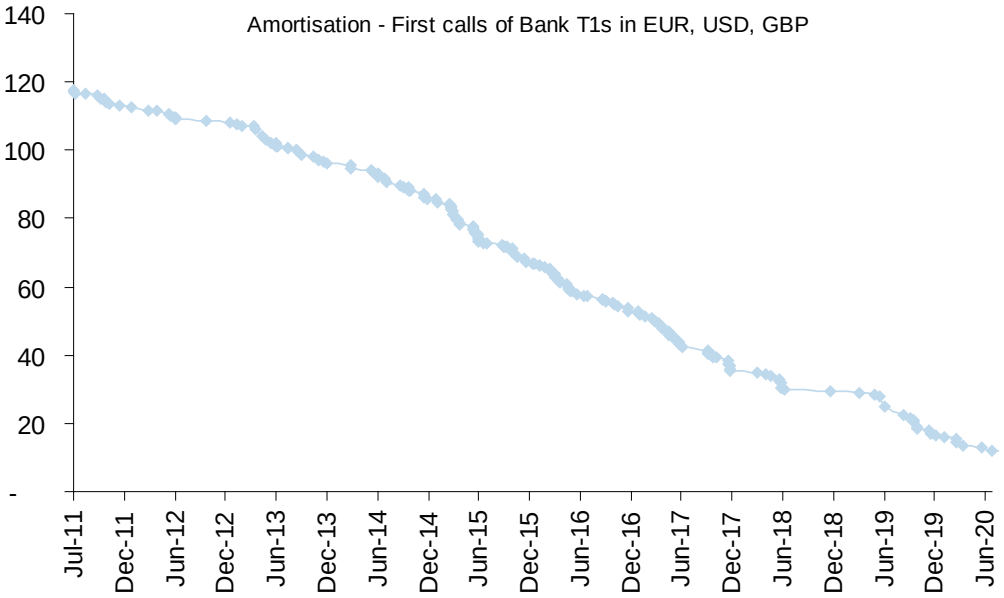
Figure 12: Outstanding Tier I and II amortization profile



Source: JP Morgan Research team and author

We can observe in the graph below the amount of Tier 1 bonds calls due over the next 10 years. These bonds will have to be grandfathered, called or otherwise should they comply with Basel III rules be left outstanding. The amount is significant.

Figure 13: Amortisation – First Calls of Bank T1s in EUR, USD and GBP



Source: Bloomberg and author

It must be noted though that owing to new special resolution regimes in EC countries some existing old non loss absorbing T1 and T2 might remain and mingle with new CoCos which could revise up/down our CoCo market size estimation.

4.4.2 Swiss vs Basel III type of CoCos

From our point of view, the Swiss CoCos are interesting as they set out two tranches of CoCos with the differentiating factor being the level at which the conversion triggers. Thus, a more senior tranches will set the trigger at 5% CT1 whereas the most subordinated piece will be set at 7% CT1. In line with the Swiss CoCo proposal, the minimum condition for these CoCos is that they should be at least Tier II compliant under Basel III. Therefore, we expect these CoCo structures to be a date subordinated instrument,

However, we find surprising the guideline of Basel III for contingent conversion instruments which are to be Tier I in nature[108]. From our standpoint, the Swiss proposal is more viable as we do not envisage a perpetual market for Basel III compliant Tier I instruments for the time being, given the sharp increment in risk of the instrument for the investor. Basel III should focus much more on the investibility of the structure as these instruments will only become effective if banks can issue them.

The CS's CoCo is the first pure Basel III compliant instrument and according to Roberto Henriques from JP Morgan (see 2011 research), underscores the principle of "super-equivalence" whereby the national regulator can impose additional requirements above Basel III minimum requirements. We expect the application of this principle to be correlated with the size of the banking sector relative to that of the economy. Recall, in terms of banking assets/GDP, the Swiss banks account for 6.0x the GDP, followed by UK at 4.9x, France at 4.0x or Spain and Germany around 3.2x. As a result, it does not come as a surprise that this disproportiate size of the Swiss banks versus the GDP calls for a more robust capital structure given the underlying risks for the economy of potential fallout of the banking system. The read-across here would be that UK regulator should follow suit given the size of the likes of Barclays, Lloyds and RBS represent a huge size of the UK GDP. However, we should be cautious when stating that. According to R. Henriques, the Swiss banks boast less capital intensive business model given the size of the wealth management in their balance sheets. As such, many of the assets under management generate revenues with a small risk weighting (Risk Weighting Assets) under Basel III and as a result, the higher capital requirements of the Swiss banks become more palatable for these institutions. On the other hand, the UK banks are very capital intensive and the implementation of similar solvency ratios and CoCos could become very damaging for the capital structure of these banks and hence place them at a disadvantageous position versus their European counterparts (Henriques 2010).

As a consequence, we do not expect the Swiss capital structure to be fully implemented in some other countries such as UK but they will be either close to that or otherwise the regulator will resort to special resolution regimes such as the 2009 Banking Act coupled with other measures such as "Bail-in" or "Living Wills"[109].

We think the ratio of bank assets to GDP will be a critical input into capital levels. We expect UK, Sweden, Denmark to follow Swiss in 10% Core Tier 1. We expect US to be 8%-9% and French and German be closer to the US.

We can infer from the graph that, on an IFRS[110] basis:

- 2 Swiss banks~600% GDP.

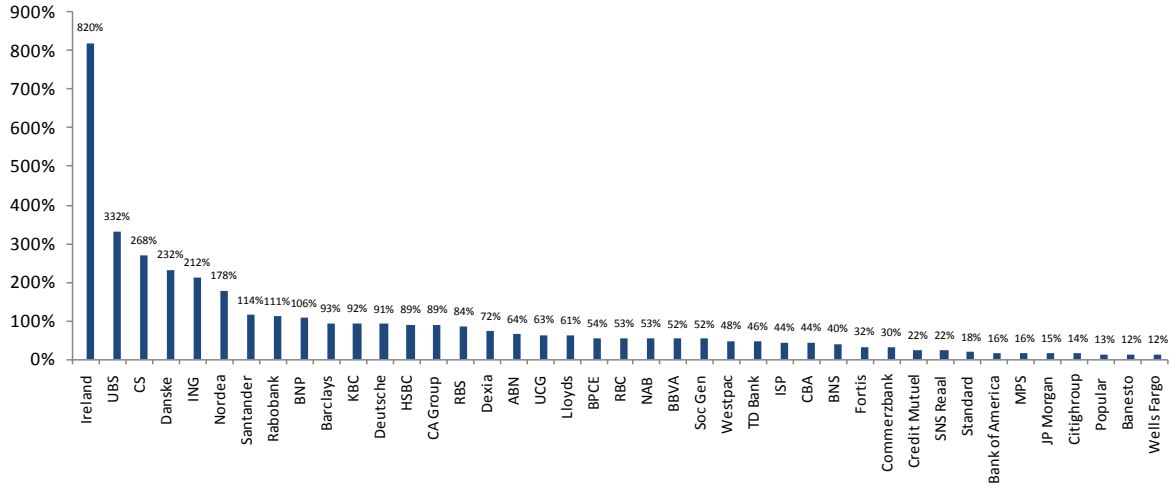
[108] Perpetual with a call date and no economic incentive to call.

[109] Includes a recovery plan or a resolution plan. The latter includes: liquidation; deposit transfer; bridge bank ("good" and "bad" bank; "bail-in" (stay or conversion) and finally "bail-out".

[110] International Financial Reporting Standards.

- 5 French banks~325% GDP.
- 5 UK banks~345% GDP.
- 5 Italian banks~140%GDP.
- 5 Spanish banks~198 GDP.

Figure 14: Banks' Assets vs Country GDP



Source: IMP and author

4.4.3 "Going Concern" versus "Gone Concern"

The major change underpinning the new hybrid capital structure under Basel III is that this structure should command a higher loss absorbency features on a "going concern" basis. This significantly differs from the limited loss absorbing features of the Basel II hybrids and more as a "gone concern" given that the principal could only be impaired upon a liquidation.

Nevertheless, we call into question the nature of the "going concern" profile of the new CoCo structures given that the conversions triggers have been fixed at very low levels relative to the enhanced minimum requirements (with the capital buffers). Consequently, the amount of losses needed to trigger these CoCos would be so big that we doubt the bank could continue operating as a "going concern".[111] In line with R. Henriques, we question whether these "out of the money" CoCos is suitable for a capital structure with is supposed to enjoy flexibility to absorb losses on a "going concern" basis. It seems to us that some of the CoCos (mostly the low trigger ones) would just be used to replace debt for equity in the event of a liquidation which we guess it really falls short of the Basel III intentions which aims, through this capital structure proposal, to quickly prop up failing banks on a "going concern" basis.

Another problem for these CoCos is the so called "point of non-viability" (PONV) language. According to Goldman Sach, the PONV has a twofold definition:

- the decision to make a public sector injection of capital, or equivalent support ,without which the firm would have become non-viable, as determined by the relevant authority; and
- A decision that a write-off, without which the firm would become non-viable, is necessary, as determined by the relevant authority.

[111] See our empirical project. In some bank to trigger the Low CoCos, losses could amount to €60bn-€70bn. This is a very unlikely scenario as the banks will have already reached the PONV and granted the regulator intervention.

Under these parameters, the low trigger CoCos would never be triggered given the huge magnitude of losses that the banks need to incur which would prompt the authority intervention under the PONV language, making the pricing and the investibility of these instruments very difficult. The pricing of these instruments would become an intricate process, as investors will not be able to correctly model the trigger point which will rely on the regulatory subjectivity[112].

Therefore, one could question the effectiveness of the suggested CoCo structures given the "out of the money" trigger instruments do not seem very compatible with the "going concern" capital thesis of Basel III. As Roberto says "after all, it has never happened that regulators have constructed an elaborate edifice of regulatory capital, only to discover that in time of distress these instruments failed completely in their intended function of providing flexibility to issuers". As such, the new CoCo structures could become ineffective and redundant with the "point of non-viability" language. [113]

Another further problem would be the introduction of alternative resolution regimes such as "bail-ins" that might prevent issuers from raising capital in a distress situation. One obvious question would be why any equity or debt investor would provide capital when the banks is undergoing distress and mounting losses, with a high likelihood of very punitive outcomes for new investors. Thus, we could not assume that capital could be raised in a distress scenario to prevent the CoCo being triggered[114].

4.4.3.1 PONV (Point of Non Viability)

Basel III includes the PONV, especially for the SIFI (Systematic Important Financial Institutions). This clause empowers the regulator to trigger the "burden sharing" across the capital structure regardless of the contractual sanctioning of the CoCos. In other words, the regulator can "bail-in" the capital structure even if the CoCos have not been set off as the trigger has not been breached. This creates from our view too much subjectivity in the capital structure and makes the pricing of CoCo much more difficult. Likewise, it increases the amount of discretion that regulators can have in exerting the "burden sharing" in the capital structure, exacerbating the investors' uncertainties. Moreover, it makes the pre-defined trigger CoCo quite redundant. We therefore believe that the PONV creates too many uncertainties and for the loss absorption to work, it is needed pre-determined thresholds so that the order of subordination is respected at all times. The removal of regulatory discretion in the CoCos for a more objective trigger will facilitate the investibility of the CoCos[115].

4.4.4 Order of subordination

Another interesting debate in the Basel III space in general and CoCo in particular is that the order of subordination could be undermined. We have been advocating throughout this section that Basel III instruments have to be consistent with "going concern" capital and the market has to have the ability to price these instruments. Some of the Basel III features such as the PONV, senior "bail-in", or low triggers might jeopardize the order of subordination as the regulator discretion on one hand and "burden sharing" on the funding market on the other hand could breach the order of subordination in

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[112] JP Morgan European Bank Bail in Survey shows, among other things, that the implementation of the subjectivity regulatory optionality makes the Coco less investible.

[113] It must be noted that this is not only specific to CoCo but to some of the recent contingent writedown Tier I structures (UCGIM 9.375% and ISPM 9.5%) that have very low trigger levels.

[114] This underscores the inability of the capital markets to raise capital for the banks during the "credit crunch" that saw the public capital "bailing out" or rescuing the banking sector.

[115] And also will allow to be rated by rating agencies. Some rating agencies are reluctant to rate these instruments because of the PONV which exacerbates the uncertainty of the outcome.

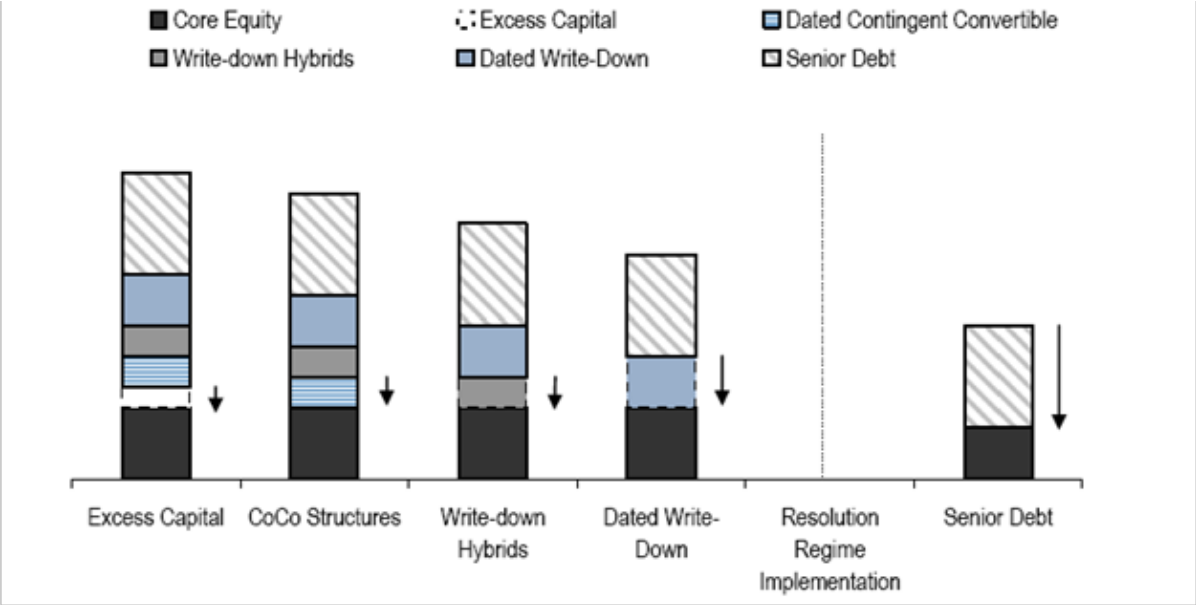
the capital structure. We advocate for a capital structure that "bails-in" the providers of risk (equity and subordinate) on a "going concern" (restructuring / liability management) and the providers of funding (senior) on a "gone concern" in the context of a resolution regime (Ineke 2011).

The new debate to preserve the order of subordination spins around the possibility of creating a new dated write down hybrid tranche above the perpetual Basel III loss absorbing instruments to champion the order of subordination and steer clear of the burden-sharing in senior.[116] Through these instruments, the bank will make a differentiation between the providers of capital and the suppliers of risk allowing the senior market to provide funds at reasonable cost levels. Moreover, the potential losses that investors might incur in at least will follow the order of subordination and will not be subject to discretionary provisions that can breach the "status quo" (PONV problem).

Following R. Henriques, the order of play should highlight the following key principles:

- Order of subordination is respected on a "going" and "gone concern" basis with new dated hybrids (with write down/up feature) in the capital structure and the avoidance of PONV.
- Senior only faces losses in a resolution regime / "gone concern" scenario.
- Risk should be accountable and measureable by investors by providing specific and objective triggers.

Figure 15: The Order of Play



Source: JP Morgan Research team

As illustrated by the graph, in the event of losses the order of play should be as follows:

1. Equity in excess of the CT1 should be the first in line to absorb losses.

[116] See "An Alternative Finish for Basel III" by R.Henriques. To make the Coco more investable and slightly more economic for the issuer, he also proposes a CoCo Fresh that has two triggers: a downside trigger (the traditional trigger if CT1 falls below a threshold) and an upside trigger (based on pre-defined share price) where the instruments are also converted into equity (like a convertible bond) allowing the investor to share some of the upside.

2. Dated CoCo structures should come second with enough size[117] to replenish the solvency. Write down / Write up instruments only allows to share losses with the equity rather than rebuilding the capital base.
3. Write down / up instruments come next in the loss absorption ranking as they only absorb losses and not rebuild capital.
    a. We share the view with R. Henriques than having temporary write downs in these instruments does not undermine the loss absorption and the write up will allow these instruments to absorb losses on an ongoing basis[118].
    b. Given the high cost of issuing CoCos, banks should be able to issue a good blend of CoCos and write down/up structures
4. After the three first layer are exhausted, the Tier II write down instruments come into play.
    a. These instruments should command lower pricing than the others due to the low probability of trigger and a "must pay" language.
5. In the event of consumptions of the entire loss absorption capital structure, a resolution regime should kick in as the issuer will probably be on a "gone concern".
    a. We think that the losses for senior holders in a resolution regime are more palatable provided that the order of subordination is preserved at all times.

4.4.4.1 Write down/Write up vs Conversion

The new array of Basel III instruments will provide for different characteristics, some of which have already been picked up by the main CoCo issuers. Loss absorbing Basel III requirements can be articulated through:

- Permanent / Temporary Write down/up bond: the bond principal is written down (permanently or temporarily) once a trigger has been breached. The principal can be written back up to par once the bank becomes profitable again and the solvency capital rebuilt.
- Equity conversion bonds (CoCos): the bond principal is converted into equity at pre-defined price once the trigger has been breached.

To decide which one is more favorable is not easy. Equity investors will be probably more inclined for the write down option as they enjoy a "free ride" as they avoid dilutions while sharing losses with debt holders. We believe fixed income investors will be torn between both as the write down option (mostly the permanent write down) offers them a meaningful downside whereas the equity option might prevent them from holding equity (if their investment mandate is fixed income only).

4.4.5 Special Resolution Regimes and "Bail-ins"

In general policy makers usually face two options with a failing bank: to rescue the banks or to let it collapse. The latter is usually very perilous given the systematic risk embedded[119] and the cost. The former can be done through "bail-outs" (with taxpayer money as it happened during the credit crisis in 2008) or through "bail-ins". This gives the regulator the power to force banks to be recapitalized from inside by using private capital and not public money. This is what inherently Basel III is aiming at. To do so the regulators has again two options:

[117] At least 3% if we assume a CT1 of 10% and a trigger of 7% to restore market confidence.

[118] Effectively they could be written down again.

[119] Remember the fallout of Lehman Brothers.

- "Bail-in" instruments such as CoCo or permanent write down instruments that have conversion or write down features to absorb the losses to prop up the capital structure. This loss absorbing features are set out in the documentation and the triggers kicks in once the solvency ratios fall below a threshold.
- Special Resolution Regimes (SRR): this framework allows the banking regulators to take over the bank at an early stage of distress through "official administration" and they are granted with powers and tools to deal with the failing entity (either restructuring or liquidation). This regime gives the authority to either convert or write down the debt instrument (even if the documentation does not state so) for example to recapitalize a failing bank . Countries with Special Resolution Regimes include UK (UK Resolution Regime 2009), Denmark (Danish Banking Act), Germany (German Banking Act) and US (FDIC Notice of Proposed Rule).

From our point of view, the potential implementation of "bail-in"/statutory regimes would result in higher expected risk profile for senior debt (the highest submarket in the international capital markets), prompting investors to ask for a higher premium for this asset class which will increase the funding cost for senior debt and hence for the overall cost of capital for the banks.

As Moody's said in January 2011, "*A critical question is whether there would be significant demand for debt that was either subject to contractual "bail-in" features or that faced the possibility of statutory write down. If not, banks would struggle to achieve the improvements in their funding structures that regulation will, in time, require. Banks are, in any event, likely to want to maximise their debt issuance prior to the new rules coming into force"*

Therefore, according to Moody's *"poorly designed instruments would carry hard-to-measure risks that could encourage poorly informed investment decisions as well as undermine investor appetite"*

4.4.5.1 Bail ins

While a more robust solvency framework and stronger capitalization for banks could imply a lower risk premiums demanded by investors, the "bail-in" in senior will probably outweigh these benefits resulting in a increase of the risk premia. The concept of "bail-ins" is not different from a corporate restructuring with a mix of write downs and debt "equitisation" to make sure the company remains as a going concern entity. The "bail-in" assumption is that under a going concern, equity and subordinate debt holders achieve a higher recovery than under a liquidation scenario. Moreover, by forcing stakeholders to share the losses, the "moral hazard" is lessened as the likelihood of "bail-out" diminishes. Below a simple "bail-in exercise". After an asset impairment that "wipes out" the equity, both the subordinate and the senior debt are fully or partially "equitied" to replenish the capital structure.

€bn

Balance Sheet		Write-Down / Loss Absorption stage	
Assets	200	**Liabilities**	
Impairment	(20)	Deposits	100
		Senior	70
		Subordindate	10
		Equity	
		Equity	20
		Writedown	(20)
Total Assets	**180**	**Total Liabilties & Equitiy**	**180**

€bn

Balance Sheet		Write-Down / Loss Absorption stage	
Assets	180	**Liabilities**	
		Deposits	100
		Senior	60
		Subordindate	0
		Equity	
		Equity	0
		Sub into equity	10
		Senior into equity	10
Total Asse	**180**	**Total Liabilties & Equitiy**	**180**

Source: author

Following JP Morgan Research team (2010), below the costs between "bail-outs" and "bail-ins

Liability Profile Impact in a Bail-Out		Liability Profile Impact in a Bail-In	
Deposits	Unaffected	Deposits	Unaffected
Senior Debt	Unaffected	Senior Debt	Would be available for either partial conversion or write-down in order to maintain the institution as a going concern.
Subordinated Debt	Largely unaffected, by bail-outs with at the margin some restrictions on distributions having being imposed due to state aid received.	Subordinated Debt	Would most likely be fully converted into equity or fully written down to absorb losses.
Equity	Diluted due to Government capital injections or at the limit rendered worthless as a result of nationalisation.	Equity	Will likely be fully impaired with the recognition of losses.

Source: JP Morgan Research team

As we can, under the "bail-out" regime only the equity and partially the subordinate debt were loss absorbing forcing tax payers to rebuild, under the "bail-in" framework, the subordinate become full loss absorbing and the senior becomes a mezzanine layer to "top up" any capital required left if needed.

In our view, the implementation of the "bail-in" regime will have enormous consequences not only for the liabilities and equity holders but for the entire economy:

- Higher cost of funding: as the cost of liabilities reprices up as the risk premium rises due to the loss absorbing features. Banks will have to offset that higher cost of funding but passing some of these costs on to the borrowers implying higher credit costs for the economy.
- Changes in funding patterns: as the banks faces higher funding costs, they will turn to cheaper sources of funding namely deposits and covered bonds exacerbating the subordination of the senior debt:
    - Increasing deposits: as a cheaper source of funding for banks, they can embark on a "deposit war"[120] to gather deposits. However, as the deposits are in nature shorter dated than wholesale funding (demand deposits), they would not work effectively in a distress scenario as they are quite vulnerable to ouftlows.
    - Increasing covered bonds: due to the increase in risk premia, banks will resort to sources of funding that entail lower costs and they are also in demand by the market due to the strong collateral. The best example is the covered bond.

4.4.5.2 Senior "bail-in"

Basel III and the EC resolution regimes contemplate the implementation of "burden sharing" features across the entire capital structure including the banking senior debt, the largest bond market in the world. In our view, the implementation of losses on senior holders on a "going concern" basis will change the dynamic of this market from funding to risk capital. Accordingly, this market will have to be priced for the embedded risks as a "going concern" capital in the event of losses and will probably become too burdensome for the capital structure of banks under Basel III. In our opinion, "burden sharing" in the senior should only come about under a "gone concern" scenario (liquidation).

Our bearish stance on the senior debt market is borne out by three facts:

- Regulation (Basel III, Solvency II[121]) seems to be pushing issuers and investors toward the covered bond format[122] going forward instead of the senior debt market. New regulation in

[120] As it happened in Spain over 2010.

[121] Solvency II is the equivalent of Basel III for insurers but much more complex.

banks seems to be moving towards a US style HolCo-OpCo structure where the senior debt will be issued by the HolCo (along with the subordinate debt) rather than the Opco (where the deposits and the bank assets are held)[123].

- Furthermore, senior "bail-in"/burden sharing will probably favor covered bond relative to a supposedly more expensive senior debt that does not qualify for regulatory solvency.
    - As more covered bonds are issued, senior becomes more subordinated implying lower recoveries in a restructuring, liquidation etc (all else equal).
    - Peripheral crisis is deepening and preventing small and weak domestic banks from tapping capital market and therefore these banks become very reliant on the covered market as the only funding source.

We really think the implementation of a "bail-in" regime for the senior market will have pernicious consequences, especially at a time when the ability of some banks (especially the peripheral banks) to issue wholesale funding is very limited. This regime will have unintended consequences in terms of higher cost of funding for the banks as the risk premium for investors will rise, the knock on effects of senior risk aversion in the largest bond market in the world and the issuance of covered bonds in detriment of senior debt as a long term wholesale funding.

The latter idea will definitely from our view undermine the rational of the resolution regimes and the Basel III "bail-in" framework. As the covered bond funding increase along the capital structure, the proportion of senior debt decreases resulting in there being less senior debt subject to any type of write down mechanism. We think the regulators is looking at the current capital structure where senior debt is the largest instrument by far and not at the future capital structure where the covered debt will outrun the senior debt, the former not subject to any type of haircut as it is secured by the mortgage pool. This might create a situation where the regulator wants to impose losses on the senior layers of the failing bank and it just realizes that there is a limited volume of senior debt and that most of the financing is coming out of instruments which are carved out of the proposed "bail-in" regime (covered bond and deposits). We are confident that the senior "bail-in" regime will encompass higher cost of funding for the banks without any workable solution in the event of a failing bank.

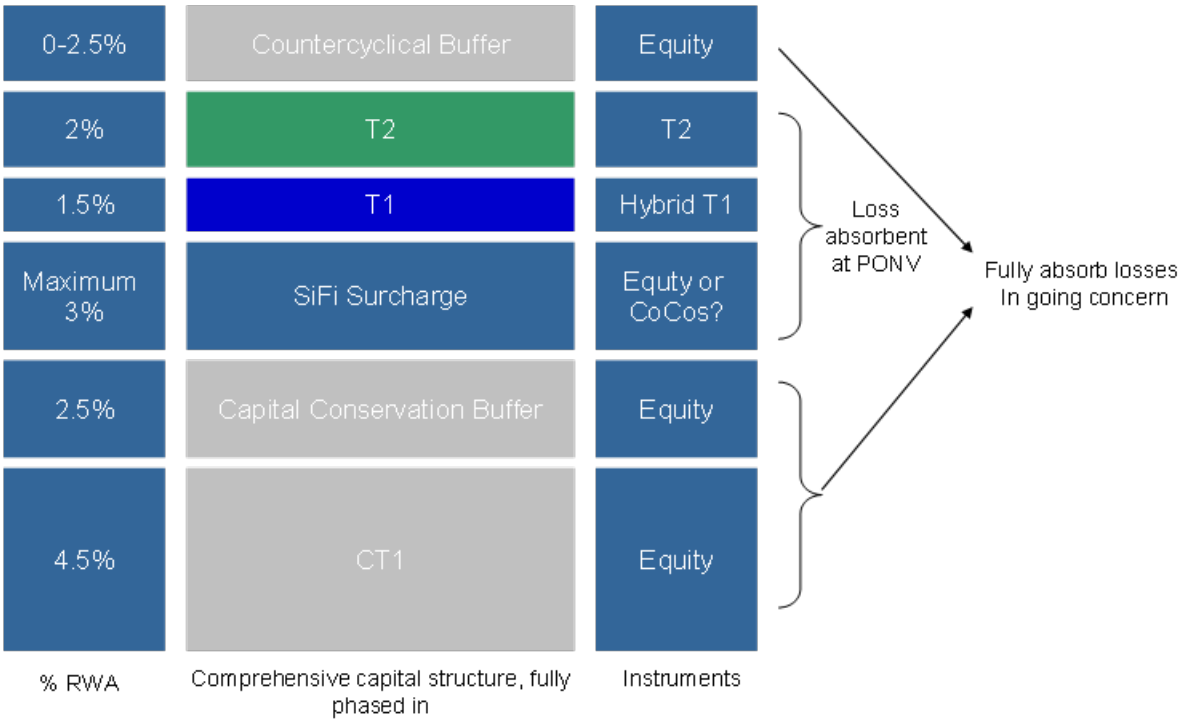
5 Final remarks

We can conclude that one of the failings of bank hybrid capital in the crisis was its inability to absorb losses whilst the bank was still a "going concern". The Basel Committee has set out the path to dramatically change the capital structure of the banks to make it loss absorbing and allow the bank to remain as a "going concern". The capital structure final outcome is still underway but we envisage a comprehensive capital structure as follows:

[122] The covered bond is a mortgage backed bond that benefits from a stream of cash flows coming from the pool of mortgages. In the event of a bank default, the covered bond is secured by the mortgage pool and also by the recourse to the entire balance sheet of the bank ranking pari passu with the senior debt holders (only in some jurisdictions such as Spain or Portugal).

[123] Increasing the cost and the subordination and hence lowering the recovery in the event of liquidation.

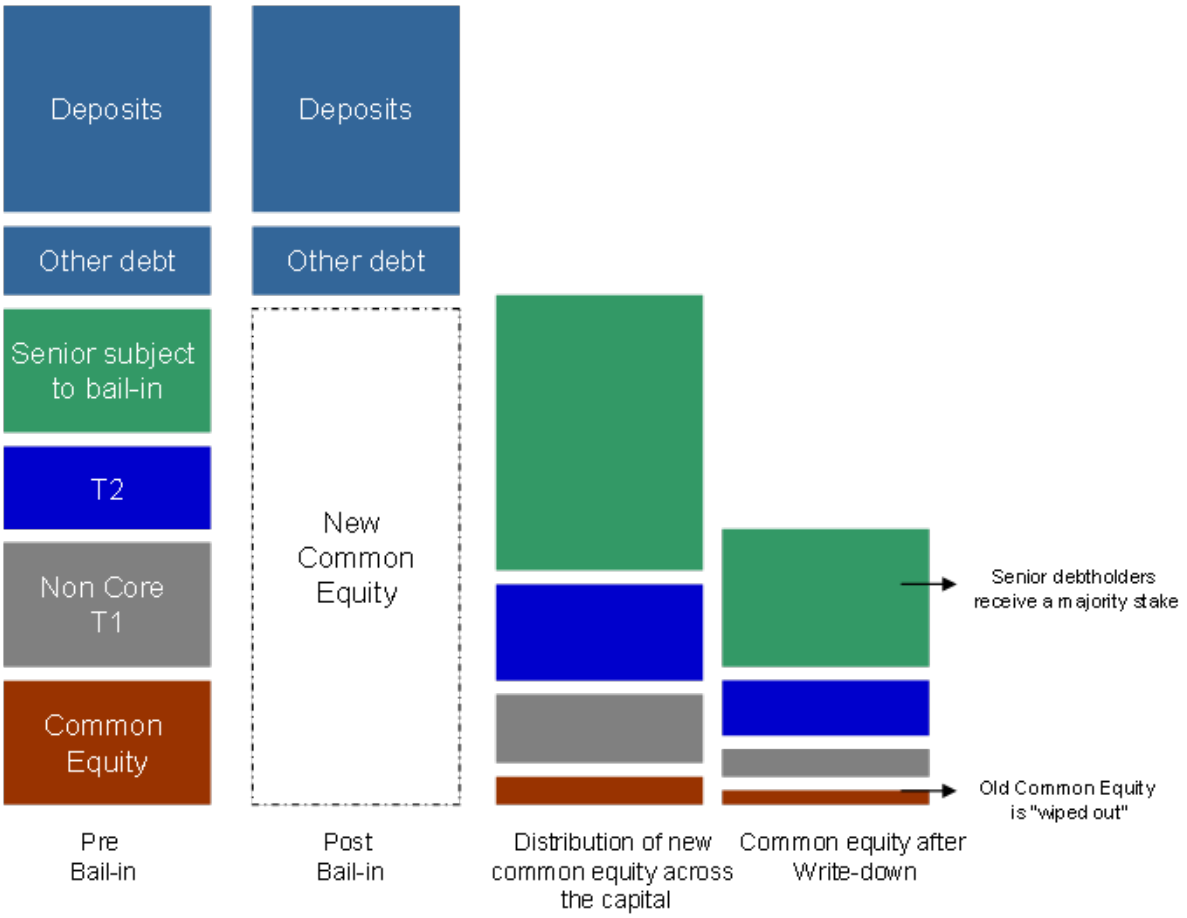
Figure 16: Potential Capital Structure



Source: author

Additionally, the "bail-in" framework that triggers the debt conversion into equity across the entire capital structure (including the senior debt) in the event of massive losses or the breach of the PONV will see the equity suffering "death by dilution" and the senior potentially becoming the major shareholder.

Figure 17: Equity "Death£ by Dilution



Source: author

If the senior "bail-in" finally goes ahead, in a extreme scenario of losses taking a toll on the balance sheet that hit the PONV, senior holders might end up with a majority controlling stake in the bank.[124] This will definitely undermine the viability of the senior market as the main funding source for the banks.

[124] So we wonder whether senior debtholders as funding providers will want to run the risk of holding equity in a "bust" bank on a "going concern" basis.

SECTION 2

The analysis seeks to evaluate the impact of a regulatory event in the cost of regulatory capital (CRC). The regulatory event triggers the CoCo as the CT1 falls below a threshold and this has an impact in terms of cost and mix of capital in the overall capital structure. We assume that the post tax losses bring the CT1 down to 4% (a very extreme scenario) triggering the conversion of the high and low Tier I and II CoCos.

We undertake a twofold analysis: we estimate the average cost of regulatory capital (ACRC) pre and post conversion of CoCos for a sample of the largest "TBTF" banks in Europe and US.

In the first part, we follow the theoretical framework laid out in section III to estimate the ACRC. Firstly, we calculate the normalized cost of equity (COE) per bank following the CAPM model. Secondly, we estimate the potential cost of the Basel III compliant Tier I and Tier II on the basis of the solvency, leverage and profitability characteristics of each bank and we come up with a potential capital structure under Basel III standards. Lastly, we estimate the ACRC (effectively the "WACC") which is the weighted average cost of the three capital structures: equity, Tier I and Tier II.

In the second part, we set out a very aggressive scenario whereby all the banks incur in losses that take the CT1 down to 4% from their Basel III normalized CT1 and thus, both the High and Low CoCos are triggered. This has a strong impact on the capital structure and hence on the ACRC. We will see that.

In the third part we will undertake a valuation exercise to evaluate the change in share price, outstanding shares and equity multiples through the conversion period.

1 First part: pre conversion analysis of the ACRC

1.1.Cost of equity

Our preferred method for calculating the cost of equity is the CAPM due to its relatively simple theoretical base and easy to use nature.

COE= RFA + Equity Beta*ERP

being RFA=Risk Free Asset and ERP=Equity Risk Premium[125]

For our main COE parameters, we estimate their values under normal market conditions. Given the acute volatility of the capital markets due to the sovereign risk, low interest rates and heavy impairment and losses in the banks that have exacerbated the earnings volatility between 2009-2010, the current COE is high relative to its normalized (historical) COE. We still think normalized COE should be higher than historically (but not significantly) due to lower ROE and higher overall ACRC[126]. The former is due to:

- Higher amount of core equity within the balance sheet under Basel III and therefore lower EPS and ROE. Equity multiples[127](and hence share price due to the correlation between P/B

[125] Please see section II in block I for further details for each of the COE components.

[126] Plus persistent high RFA as the sovereign bond yield will remain high due to macro pressures (fiscal deficit, structural problems etc) on the sovereigns.

[127] Price to Book (P/B), Price Earning (P/E) to name a few.

and ROE) are supposed to remain subdued for a while as the ROE decreases while the banks adapt their business to suit the capital structure under Basel III[128].
- Fewer high ROE businesses which usually entail higher capital requirements and therefore many banks will forsake as they become too capital intensive for regulatory capital purposes.

In other words, lower yielding ROE businesses for higher amount of equity in the balance sheet.

The latter is due to:

- Higher cost of funding under Basel III through a more comprehensive "burden sharing" capital structure that translates into a higher cost of equity. As we have seen in this section, Tier I and Tier II CoCo type of instruments can easily yield between 8%-9.5% which surpasses the average dividend yield of the banks. If we assume equity multiples will remain low until ROE normalizes and debt yield outrun the dividend yield, COE will probably go up.

However, one can make a thesis about a future lower COE given the more conservative and protectionist Basel III capital structure which aims to bolster the balance sheet and smooth the implicit earning volatility of the banks. From our view, this could be a partial offsetting factor to our "higher than historical COE thesis" but we strongly believe COE will probably rise[129].

Risk Free Asset (RFA)

For the risk free rates we have used the 10 year bond yields for the countries where the banks do the majority of their business. We normalize the RFA as of 30th of March 2011. At this time, sovereign crisis was worsening that witnessed peripheral sovereign bond yields trading 500bps above the German bund. We aim to normalize these levels based on historical trends and mostly through a comprehensive analysis of the current and future "macro" state of the sovereigns.

Beta

Currently the beta of the banking sector is trading high (1.4) relative to its historical levels (1.1) leading to a very high COE as a result of the volatility of the earning, the uncertainty of the outcome of Basel III, the sovereign concerns and the credit quality of the banks. We expect the beta of the banking sector to gradually move down to its historical level for three reasons:

- Financial leverage will drop under Basel III.
- Earnings volatility in many banks (mostly wholesale banks) will also go down as some highly volatile businesses (securitization) will be scaled back due to the new capital constraints. Many banks will have to return to the more stable lending business if the wholesale business becomes very capital intensive under Basel III.

[128] In appendix 7 we estimate the implied valuation (as of April 2011) of the biggest European banks based on the 2013 market consensus ROE from Bloomberg. We aim to work out the improvement in ROA from the current levels in order to meet the market consensus ROE which stands at around 9.8%. Banks needs 50bps of improvement in ROA to meet the low 9.8%. Banks are overall estimating 12%-14% ROE by 2013 so we struggle to see how they are will achieve that if then have to improve the ROA by 100bps.

[129] In appendix 8 we illustrate our "bearish" stance on European financial equities (looking at the main four drivers: growth, returns, volatility and multiples) given the impact of Basel III, the sovereign crisis and the difficulty to do right issues to shore up solvency. Banks seem to be trapped in a "Catch 22" given the Basel III requires higher solvency than can only met via capital raises (banks are trading below P/B so not economical) or RWA declines (away from high intensive capital business and hence higher ROEs) that will put inevitably pressure on ROEs.

- Operating leverage will probably smooth out as the banks focus on the efficiency ratio (cost/income ratio) as the top line of the P&L (earnings in the profit and loss account) struggles to return former ROEs.

For the current beta we have used a 5 year period back to September 2005 and for the historical beta we have used a 20 year period up to the start of the financial crisis (September 1987). If we use SX7P Index as the dependent variable and SXXP Index as the independent variable, the regression outcome is as follows:

	Raw Beta	R^2
Current Beta	1.409	1.039
Historical Beta	0.821	0.811

Source: author

For our cost of equity, we stick to the historical beta as our normalized beta.

Equity Risk Premium (ERP)

As discussed in block I, while the RFA is easily observable and betas can be estimated using historical data or industry betas, the ERP is not straightforward. Recall there are several methods to estimate the equity premium ranging from the realized excess return of equity over government bonds in the past; the excess return over bonds investors have expected from equities in the past or the excess return investors currently require from equities relative to bonds, just to name a few (Graham 2005)

Given the sensitivity of the ERP on the COE, it is essential to accurately estimate the ERP to avoid over/underestimate the COE estimation. Below, a summary of the ERP estimates as of March 2010 by JP Morgan.

Methods	ERP
Historical U.S geometric mean since 1926	4.5%
Geometric academic survey	5.0%
Constant sharpe ratio	5.1%
Implied from AA bonds	5.1%
Implied from dividend discount model	6.0%
Arithmetic academic survey	6.0%
Historical U.S arithmetic mean since 1926	6.4%

Source: author

Unlike our distressed WACC analysis where we used a 5% ERP, we have decided to increase our ERP by 50bps to a 5.5% for our banks sample, which is line with the most recent academic studies (see Damodaran) on the ERP for banks and what we think investors expect to require. Recall, the banking industry is a high beta and alpha sector and hence investors tend to demand a higher equity return to be compensated for the intrinsic risk of this industry[130].

If we put all these variables together, we derive to the individual COE per bank and the average COE for our sample which comes out at 9.9% for the sample.

[130] The recovery for the equity in the event of a restructuring is usually null given the high leverage of the capital structure.

Company	Region	RFA	Index	Beta		ERP	COE	
				Current Beta	Historical Beta		Current	Historical
Bank of America	US	3.1%	SPX	2.38	1.09	5.5%	16.1%	9.0%
Citigroup	US	3.1%	SPX	2.84	1.42	5.5%	18.7%	10.9%
Goldman Sachs	US	3.1%	SPX	1.66	1.33	5.5%	12.2%	10.4%
Morgan Stanley	US	3.1%	SPX	2.26	1.02	5.5%	15.5%	8.7%
JP Morgan	US	3.1%	SPX	2.01	1.28	5.5%	14.1%	10.1%
Wells Fargo	US	3.1%	SPX	1.85	1.15	5.5%	13.2%	9.4%
Credit Suisse	Europe	2.8%	SXXP	1.66	1.36	5.5%	11.9%	10.3%
UBS	Europe	2.8%	SXXP	1.61	1.14	5.5%	11.6%	9.0%
Deustche Bank	Germany	2.7%	PXAP	1.54	1.16	5.5%	11.1%	9.0%
Barclays	UK	3.5%	ASX	2.04	1.44	5.5%	14.7%	11.4%
RBS	UK	3.5%	ASX	1.93	1.32	5.5%	14.1%	10.8%
Lloyds	UK	3.5%	ASX	1.84	1.23	5.5%	13.6%	10.3%
HSBC	UK	3.5%	ASX	1.04	1.31	5.5%	9.2%	10.7%
Standard	Europe	2.8%	SXXP	1.46	1.23	5.5%	10.8%	9.5%
BNP	France	3.0%	CAC	1.36	1.13	5.5%	10.5%	9.2%
Soc Gen	France	3.0%	CAC	1.52	1.21	5.5%	11.4%	9.7%
Santander	Spain	4.1%	IBEX	1.41	1.04	5.5%	11.9%	9.9%
BBVA	Spain	4.1%	IBEX	1.42	1.23	5.5%	12.0%	10.9%
Unicredit	Italy	4.0%	FTSEMIB	1.62	1.07	5.5%	12.9%	9.9%
ISP	Italy	4.0%	FTSEMIB	1.30	1.07	5.5%	11.1%	9.9%
Average		3.3%		1.74	1.21	5.5%	12.8%	9.9%

Source: author

We can observe the difference between the current and the historical (normalized) COE. The difference is mainly driven by the beta. At the current ROE, few banks are barely covering their COE so we expect the banks to diligently manage their COE and ROE as the new Basel III rules puts pressure on the cost of equity. Additionally, in the event of actual and potential losses, COE increases as the risk of contingent capital[131] trigger becomes more likely.

1.2 Cost of Tier I and Tier II

To estimate the price of the Tier 1 and 2 type of CoCos we look at the CS's CoCos (7.8% coupon)[132] and then we extrapolate the potential cost of these instruments by turning at the fundamental quality of the company in terms of solvency, leverage and profitability. We conduct the following analysis:

1. We use the main solvency, leverage and profitability ratios, namely Core Tier 1, TCE ratio and the normalized ROTE.[133]. We assign a rating (1-7) in ascending order[134] for each metric and then we calculate the blended scoring for the bank. The weighting is as follows:

[131] Mostly if the trigger implies debt equity conversion rather than a debt write-down.

[132] We discard the Lloyds CoCo as it was issued to allow the bank to pass the stress tests. Additionally, the conversion price is set at the time of the issuance, which is different from we can expect from the Swiss type of CoCos , whose conversion price is set at the time of the triggering event.

[133] TCE: it is the Tangible Common Equity ratio and is calculated: (Common Equity - Intangibles and Goodwill)/(Total Assets – Intangibles and Goodwill); ROTE is the Return on Tangible Equity and is calculated: Net Income for common equity / (Common Equity – Intangibles and Goodwill).

[134] Meaning the higher the ratio the higher the rating.

CT1	70%
TCE	15%
ROTE	15%

Amongst these three metrics, they key determinant in the pricing of the CoCo should be the probability of the conversion option triggering, with the relative size of the CT1 buffer above the trigger level being the most important input. Therefore, we believe that the market will look at the level of CT1 to assess the solvency of the bank and to price the CoCo accordingly.

2. We evaluate how CS's rating stacks up versus its peers and relative to the price of its CoCo (High Trigger Tier II) and we draw up a list of potential prices for the High Trigger Tier II CoCo in line with the blended scoring per bank. We assign a potential price for such Coco to each bank.
.
3. We assign potential prices for the three remaining CoCos, namely Low Trigger Tier II and High and Low Trigger Tier I with the following spreads to the CS's High Trigger CoCo:
    - Low Trigger Tier II: -2%
    - High Trigger Tier I: +1%
    - Low Trigger Tier II: -1%

	Solvency ratios			Capital Structure per layer		
	CT1	Tier I	Tier II	CT1	Tier I	Tier II
Banc of America	9.5%	12.0%	15.0%	63.3%	16.7%	20.0%
Citigroup	9.5%	12.0%	15.0%	63.3%	16.7%	20.0%
Goldman Sachs	9.5%	12.0%	15.0%	63.3%	16.7%	20.0%
Morgan Stanley	9.5%	12.0%	15.0%	63.3%	16.7%	20.0%
JP Morgan	9.5%	12.0%	15.0%	63.3%	16.7%	20.0%
Wells Fargo	9.5%	12.0%	15.0%	63.3%	16.7%	20.0%
Credit Suisse	10.0%	13.0%	19.0%	52.6%	15.8%	31.6%
UBS	10.0%	13.0%	19.0%	52.6%	15.8%	31.6%
Deustche Bank	9.0%	11.5%	14.5%	62.1%	17.2%	20.7%
Barclays	10.0%	12.5%	15.5%	64.5%	16.1%	19.4%
RBS	10.0%	12.5%	15.5%	64.5%	16.1%	19.4%
Lloyds	10.0%	12.5%	15.5%	64.5%	16.1%	19.4%
HSBC	10.0%	12.5%	15.5%	64.5%	16.1%	19.4%
Standard	10.0%	12.5%	15.5%	64.5%	16.1%	19.4%
BNP	9.0%	11.5%	14.5%	62.1%	17.2%	20.7%
Soc Gen	9.0%	11.5%	14.5%	62.1%	17.2%	20.7%
Santander	9.0%	11.5%	14.5%	62.1%	17.2%	20.7%
BBVA	9.0%	11.5%	14.5%	62.1%	17.2%	20.7%
Unicredit	9.0%	11.5%	14.5%	62.1%	17.2%	20.7%
ISP	9.0%	11.5%	14.5%	62.1%	17.2%	20.7%
Average	**9.5%**	**12.1%**	**15.4%**	**62.1%**	**16.6%**	**21.2%**

Source: author

1.3 Capital structure and weightings

To determine the capital base of the banks, we use the guidelines of the comprehensive Basel III capital structure including all the buffers (the countercyclical and capital conservation buffer). As we are dealing with big and systematic banks (TBTF banks) in our sample, we also think necessary to account for the TBTF buffer.

We foresee the following levels of solvency per ratio and per country:

	CT1	TIER I	TIER II
US	9.5%	12.0%	14.5%
UK	10.0%	12.5%	15.0%
Switzerland	10.0%	13.0%	19.0%
Germany	9.0%	11.5%	14.0%
Spain	9.0%	11.5%	14.0%
France	9.0%	11.5%	14.0%
Italy	9.0%	11.5%	14.0%

Source: author

We believe UK will follow Switzerland in terms of CT1 at 10%[135] but its total capital base will probably be lower than that of the Swiss banks (15% vs 19%).The US regulator, given the size of its banks, will probably set a minimum 9.5% CT1 for an overall capital ratio of 15%. For the other countries we use a CT1 around 9.0% for a total capital base of 14.5%.

1.4 Average Cost of Regulatory Capital

Once we factor all the assumptions into the model, the ACRC for the sample comes in at 9.1% on average for the entire sample, slightly south of the overall COE at 9.9% underlying the expensive profile of the new Basel III regulatory capital with a weighted average cost of the Tier I layer well above the 9% for the banks.

[135] As a result of the high Assets/ GDP ratio.

	Cost of Regulatory Capital (CRC)					
		Tier I		Tier II		
	Long Run COE at 5.5% ERP	High Trigger at 7%	Low Trigger at 5%	High Trigger at 7%	Low Trigger at 5%	Average CRC
Banc of America	9.0%	9.5%	7.5%	8.5%	6.5%	**8.6%**
Citigroup	10.9%	9.5%	7.5%	8.5%	6.5%	**9.8%**
Goldman Sachs	10.4%	8.6%	6.6%	7.6%	5.6%	**9.2%**
Morgan Stanley	8.7%	9.0%	7.0%	8.0%	6.0%	**8.2%**
JP Morgan	10.1%	9.2%	7.2%	8.2%	6.2%	**9.2%**
Wells Fargo	9.4%	9.9%	7.9%	8.9%	6.9%	**9.0%**
Credit Suisse	10.3%	8.8%	6.8%	7.8%	5.8%	**8.8%**
UBS	9.0%	8.5%	6.5%	7.5%	5.5%	**8.0%**
Deustche Bank	9.0%	9.4%	7.4%	8.4%	6.4%	**8.6%**
Barclays	11.4%	9.0%	7.0%	8.0%	6.0%	**10.0%**
RBS	10.8%	9.1%	7.1%	8.1%	6.1%	**9.6%**
Lloyds	10.3%	9.3%	7.3%	8.3%	6.3%	**9.4%**
HSBC	10.7%	9.5%	7.5%	8.5%	6.5%	**9.7%**
Standard	9.5%	9.4%	7.4%	8.4%	6.4%	**8.9%**
BNP	9.2%	9.1%	7.1%	8.1%	6.1%	**8.6%**
Soc Gen	9.7%	9.5%	7.5%	8.5%	6.5%	**9.0%**
Santander	9.9%	9.4%	7.4%	8.4%	6.4%	**9.1%**
BBVA	10.9%	9.0%	7.0%	8.0%	6.0%	**9.6%**
Unicredit	9.9%	9.3%	7.3%	8.3%	6.3%	**9.1%**
ISP	9.9%	10.2%	8.2%	9.2%	7.2%	**9.4%**
Average	**9.9%**	**9.3%**	**7.3%**	**8.3%**	**6.3%**	**9.1%**

Source: author

The table below show the excess between the normalized ROE and the COE (and the ACRC). On average, the banks should be able to return an excess of 3.9% to their shareholders (as the difference between ROE and COE) and 4.8% over the ACRC implying the small pick up between the excess return over the COE and ACRC due to the high costly capital structure.

				Excess Return over CRC	
	Average CRC	Long Run COE at 5.5% ERP	Norm. ROE	Excess return to COE	Excess return to ACRC
Banc of America	8.6%	9.0%	16.3%	7.3%	7.7%
Citigroup	9.8%	10.9%	10.5%	-0.4%	0.7%
Goldman Sachs	9.2%	10.4%	10.1%	-0.2%	1.0%
Morgan Stanley	8.2%	8.7%	9.0%	0.3%	0.8%
JP Morgan	9.2%	10.1%	16.4%	6.3%	7.2%
Wells Fargo	9.0%	9.4%	19.1%	9.7%	10.1%
Credit Suisse	8.8%	10.3%	13.1%	2.8%	4.3%
UBS	8.0%	9.0%	9.0%	0.0%	1.0%
Deustche Bank	8.6%	9.0%	9.0%	0.0%	0.4%
Barclays	10.0%	11.4%	14.3%	2.8%	4.3%
RBS	9.6%	10.8%	10.1%	-0.7%	0.5%
Lloyds	9.4%	10.3%	14.9%	4.6%	5.5%
HSBC	9.7%	10.7%	16.0%	5.3%	6.3%
Standard	8.9%	9.5%	17.0%	7.5%	8.1%
BNP	8.6%	9.2%	14.4%	5.1%	5.8%
Soc Gen	9.0%	9.7%	16.1%	6.4%	7.1%
Santander	9.1%	9.9%	22.0%	12.2%	12.9%
BBVA	9.6%	10.9%	20.0%	9.1%	10.4%
Unicredit	9.1%	9.9%	11.2%	1.4%	2.2%
ISP	9.4%	9.9%	9.2%	-0.7%	-0.2%
Average	**9.1%**	**9.9%**	**13.9%**	**3.9%**	**4.8%**

Source: author

2 Second part: Pre conversion analysis of the ACRC

In the second part we test the impact of the CoCos conversion on the cost of the regulatory capital for the banks. Our aim is to evaluate the impact on both the cost and the capital structure once the High and Low Trigger CoCos are sanctioned due to significant losses. We highlight that the trigger of both CoCos would not be too realistic under the PONV thesis outlined above given the size of the losses could definitely prompt the regulator intervention. However, it allows us to estimate the impact on the ACRC of the CoCo conversion and the change in the capital mix of the banks.

Before going about the analysis we set out the main assumptions:

- Conversion share price: we use the third methodology in section 4.2 whereby the conversion strike price is set as a function of the loss required to the CT1 to trigger the CoCos (both High and Low).
    - We pre-determine a conversion share price as a function of the solvency trigger level for each CoCos (High and Low). Therefore, if a bank has now a 10% CT1, the pre-set

strike price for each tranche of CoCo would be 30% (High CoCo) and 50% (Low CoCo) below the share price at the point of issuance.[136]

- CT1 after losses: we assume one off losses bring the CT1 down to 4% from its normalized level effectively triggering both High and Low CoCos.
- CT1 after losses and conversion: we assume CT1 for all banks should return at least to 8% after conversion.
- ERP (Equity Risk Premium) after conversion: we assume that the ERP should creep up by at least 100bps to 6.5% from the 5.5% pre conversion level given the change in capital mix (more equity base) and the underlying risk of a potential failing bank.
- Taxes: we assume a 30% rate for all losses.
- Normalized earnings: we are using our estimation of normalized earnings in the model for each bank. We assume then that losses happen in a quarter on a one-off basis[137] and the normalized earnings then do not change.

We conduct a Post CoCos conversion solvency analysis for each bank in our sample. For explanatory purposes we take BAC analysis:

[136] In line with JP Morgan, we assume a linear relationship between the fall in CT1 and the strike price at which the conversion takes place.

[137] A very aggressive assumption for two reasons: the scale of the one off losses are unrealistic (write-down of €50bns are not common) and secondly significant one off losses usually have side effects that drive the normalized earnings down.

BAC	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	211,686	(80,077)	131,609	58,238	189,847
Additions / (Deductions)	(73,371)		(73,371)		(73,371)
Core Tier 1 under Basel III	138,315		58,238		116,476
High Trigger CoCos (50% T1; 50% T2)	36,399		36,399	(36,399)	-
Low Trigger CoCos (50% T1; 50% T2)	43,679		43,679	(21,839)	21,839
MarketCap	136,332		345,219		345,219
RWA	1,455,951		1,455,951		1,455,951
Normalized Earnings	34,522		34,522		34,522
CT1 %	9.5%		4.0%		8.0%
Tier 1 %	12.0%		6.5%		8.0%
Tier 2 %	15.0%		9.5%		9.5%
# shares (000.000)	10,121		10,121	10,809	20,930
BV / share	20.9		13.0		9.1
ROE	16%		26%		18%
P/BV	0.6x		2.6x		1.8x
Share price	**13.5**		**34.1**		**16.5**
Downside %			**153%**		**22%**
Value of CoCos					178,281
Conversion Share Price (40%)	5.4				
CT1 after initial losses	4.0%			CT1	6.5%
CT1 to be raised to	8.0%			TO 8%	1.5%
Tax at 30%	0%				21,839

Source: author

We describe our assumptions and calculation per column. We assume the same amount of CT1 deductions to get to the CT1:

- Initial solvency: we use book equity value and solvency related metrics under Basel III on a normalized basis. For example, BAC under a 9.5% CT1 should have a CT1 of $138bn assuming the same RWA[138] as of Q4 2010. If we also assume a normalized Basel III Tier 1 and Tier 2 ratio of 12% and 15% respectively and 50% of the T1 are High Trigger CoCos and the other 50% are Low Trigger CoCos (being T2 the balance), then BAC could have $36bn of T1 CoCos and $44bn of T2 CoCos.
- Post tax loss: we assume sudden losses bring the CT1 below 4% (equivalent of $80bn of post-tax losses).
- Solvency post loss: this columns shows how the common equity drops by the $80bn of post-tax losses to $131bn from $212bn pre losses and hence the CT1 to 4% from 9.5%.
- Conversion: this column shows the conversion of the full $36bn of T1 CoCos and $22bn of the T2 CoCos that result in a $58bn of new common equity.

[138] We don't assume any RWA inflation or mitigation.

- Solvency post conversion: This column shows how both the common equity and the CT1 goes up by the aforementioned $58bn bringing the CT1 back to the 8% level. After full and partial of T1 and T2 respectively, T1 ratio comes down to 8% (equal to CT1 after T1 hybrids are fully converted) and T2 to 9.5% (only $21bn of outstanding T2 CoCos)

	Regulatory capital structure						
	Pre conversion event			Post conversion event			
	CT1	Tier I	Tier II	CT1	Tier I	Tier II	Average CRC
Banc of America	63.3%	16.7%	20.0%	84.2%	0.0%	15.8%	**9.7%**
Citigroup	63.3%	16.7%	20.0%	84.2%	0.0%	15.8%	**11.5%**
Goldman Sachs	63.3%	16.7%	20.0%	84.2%	0.0%	15.8%	**10.9%**
Morgan Stanley	63.3%	16.7%	20.0%	84.2%	0.0%	15.8%	**9.3%**
JP Morgan	63.3%	16.7%	20.0%	84.2%	0.0%	15.8%	**10.7%**
Wells Fargo	63.3%	16.7%	20.0%	84.2%	0.0%	15.8%	**10.1%**
Credit Suisse	52.6%	15.8%	31.6%	61.5%	0.0%	38.5%	**9.8%**
UBS	52.6%	15.8%	31.6%	61.5%	0.0%	38.5%	**8.8%**
Deustche Bank	62.1%	17.2%	20.7%	84.2%	0.0%	15.8%	**9.7%**
Barclays	64.5%	16.1%	19.4%	84.2%	0.0%	15.8%	**12.0%**
RBS	64.5%	16.1%	19.4%	84.2%	0.0%	15.8%	**11.3%**
Lloyds	64.5%	16.1%	19.4%	84.2%	0.0%	15.8%	**10.8%**
HSBC	64.5%	16.1%	19.4%	84.2%	0.0%	15.8%	**11.3%**
Standard	64.5%	16.1%	19.4%	84.2%	0.0%	15.8%	**10.2%**
BNP	62.1%	17.2%	20.7%	42.1%	0.0%	57.9%	**8.5%**
Soc Gen	62.1%	17.2%	20.7%	84.2%	0.0%	15.8%	**10.4%**
Santander	62.1%	17.2%	20.7%	84.2%	0.0%	15.8%	**10.3%**
BBVA	62.1%	17.2%	20.7%	84.2%	0.0%	15.8%	**11.3%**
Unicredit	62.1%	17.2%	20.7%	84.2%	0.0%	15.8%	**10.4%**
ISP	62.1%	17.2%	20.7%	84.2%	0.0%	15.8%	**10.5%**
Average	**62.1%**	**16.6%**	**21.2%**	**79.8%**	**0.0%**	**20.2%**	**10.4%**

Source: author

We can see in the table above that the overall post conversion ACRC climbs up to 10.4% from 9.1%. A significant uptick on absolute levels no doubt, but lower than a similar exercise under a Basel II capital structure (cost of Basel II hybrids averages 6.5%) due to the high cost of the new CoCos.

	Excess Return over CRC				
	Average CRC	Long Run COE at 6.5% ERP	Norm. ROTE	Excess return to COE	Excess return to ACRC
Banc of America	9.7%	10.1%	16.3%	6.2%	6.6%
Citigroup	11.5%	12.3%	10.5%	-1.8%	-1.0%
Goldman Sachs	10.9%	11.7%	10.1%	-1.6%	-0.8%
Morgan Stanley	9.3%	9.7%	9.0%	-0.7%	-0.3%
JP Morgan	10.7%	11.4%	16.4%	5.1%	5.7%
Wells Fargo	10.1%	10.5%	19.1%	8.6%	9.0%
Credit Suisse	9.8%	11.6%	13.1%	1.5%	3.3%
UBS	8.8%	10.2%	9.0%	-1.2%	0.2%
Deustche Bank	9.7%	10.2%	9.0%	-1.2%	-0.7%
Barclays	12.0%	12.9%	14.3%	1.4%	2.3%
RBS	11.3%	12.1%	10.1%	-2.0%	-1.2%
Lloyds	10.8%	11.5%	14.9%	3.4%	4.1%
HSBC	11.3%	12.0%	16.0%	4.0%	4.7%
Standard	10.2%	10.8%	17.0%	6.2%	6.8%
BNP	8.5%	10.4%	14.4%	4.0%	5.9%
Soc Gen	10.4%	10.9%	16.1%	5.2%	5.7%
Santander	10.3%	10.9%	22.0%	11.1%	11.7%
BBVA	11.3%	12.1%	20.0%	7.9%	8.7%
Unicredit	10.4%	10.9%	11.2%	0.3%	0.9%
ISP	10.5%	10.9%	9.2%	-1.8%	-1.3%
Average	**10.4%**	**11.2%**	**13.9%**	**2.7%**	**3.5%**

Source: author

After the conversion of the T1 and T2 CoCos, the COE goes up from 9.9% to 11.2% and the ACRC from 9.1% to 10.4% giving a 2.7% excess return over COE and 3.5% over ACRC. We can observe that notwithstanding the big losses, the ACRC creeps up but less than expected due to high cost of the T1 and T2 instruments under Basel III. The increase in COE after losses due to the increase in ERP and the amount of equity within the capital structure is offset by the lower mix of CoCos in the overall ACRC.

Below, the absolute levels of ACRC pre and post conversion per bank.

	CRC Pre and Post Conversion		
	Pre	Post	Change %
	Average CRC	Average CRC	
Banc of America	8.6%	9.7%	12.4%
Citigroup	9.8%	11.5%	17.7%
Goldman Sachs	9.2%	10.9%	19.0%
Morgan Stanley	8.2%	9.3%	12.6%
JP Morgan	9.2%	10.7%	16.5%
Wells Fargo	9.0%	10.1%	12.3%
Credit Suisse	8.8%	9.8%	11.3%
UBS	8.0%	8.8%	9.6%
Deustche Bank	8.6%	9.7%	13.6%
Barclays	10.0%	12.0%	19.2%
RBS	9.6%	11.3%	17.4%
Lloyds	9.4%	10.8%	15.6%
HSBC	9.7%	11.3%	16.2%
Standard	8.9%	10.2%	14.5%
BNP	8.6%	8.5%	-1.5%
Soc Gen	9.0%	10.4%	14.7%
Santander	9.1%	10.3%	13.7%
BBVA	9.6%	11.3%	18.0%
Unicredit	9.1%	10.4%	14.3%
ISP	9.4%	10.5%	11.7%
Average	**9.1%**	**10.4%**	**13.9%**

Source: author

2.1 Sensitivity analysis

We run a sensitivity scenario analysis to assess the levels of post conversion ACRC. We sensitize the main two drivers of the post conversion ACRC, namely the “after losses” CT1 and the “after losses” ERP. We observe that the range of ACRC values is very wide from 8.7% (6.5% CT1 and 5.0% ERP) to 11.8% (4% CT1 and 8.0% ERP). Our base case scenario is that ACRC should range between 9.5% to 10.5%, given losses should never bring CT1 below 5% (the bank would reaching the PONV and the regulator would step in way before CT1 drops below these levels) and the ERP should at least creep up by 100bps to 6.5% given the new risk reward demanded by investors.

ACRC after losses

ERP \ CT1 after losses	4.0%	4.5%	5.0%	5.5%	6.0%	6.5%
5.0%	8.9%	8.8%	8.7%	8.7%	8.7%	8.7%
5.5%	9.4%	9.3%	9.1%	9.1%	9.1%	9.1%
6.0%	9.9%	9.8%	9.5%	9.6%	9.5%	9.5%
6.5%	10.4%	10.2%	9.9%	10.0%	9.9%	9.9%
7.0%	10.9%	10.7%	10.4%	10.4%	10.3%	10.2%
7.5%	11.3%	11.2%	10.8%	10.8%	10.7%	10.6%
8.0%	11.8%	11.6%	11.2%	11.3%	11.1%	11.0%

Source: author

The table below show the "bps" hike in ACRC after losses. We estimate a normalized ACRC increases between 80bps-150bps.

Bps hike in ACRC after losses

ERP \ Bps of drop in CT1 after losses	4.0%	4.5%	5.0%	5.5%	6.0%	6.5%
5.0%	-17 bps	-25 bps	-40 bps	-38 bps	-39 bps	-41 bps
5.5%	31 bps	21 bps	2 bps	4 bps	1 bps	-2 bps
6.0%	80 bps	68 bps	43 bps	47 bps	42 bps	37 bps
6.5%	128 bps	114 bps	85 bps	89 bps	82 bps	76 bps
7.0%	177 bps	160 bps	127 bps	131 bps	123 bps	115 bps
7.5%	225 bps	206 bps	168 bps	174 bps	164 bps	155 bps
8.0%	273 bps	252 bps	210 bps	216 bps	204 bps	194 bps

Source: author

3 Valuation considerations

Banks usually trade on both Price to Book (P/B)[139] and Price Earnings (P/E). Our prefer method is the standard Gordon Growth Model (GGM):

Price to Book = (ROE-g) / (COE-g)

Where

g = growth rate

ROE: Return on Equity

COE: Cost of Equity

P/B (Price to Book): Market Capitalization / Book Equity

P/E (Price Earnings ratios): Market Capitalization / Net Income

[139] Over the turmoil and given the doubtful value of the intangibles and goodwill market turned to Price to Tangible Book .

Historically, there has been a strong correlation between the P/B multiple versus the ROE in banks. If ROE is higher than the COE, P/B should trade above 1x as the ROE effectively covers the bank's COE (Morgan Stanley 2003).

Following our cost of capital regulatory framework, we look at the valuation of our sample of bank pre and post regulatory event to observe the evolution of the shares count, the book value per share, the normalized ROE and the P/B multiple through the conversion period.

As expected, the number of share count grows by 84% (101mn of new shares) due to the conversion of debt into equity. The Italian banks (Unicredit and ISP) experiences the highest share conversion well above 100%. The Swiss banks (CS and UBS) suffers the least dilution due to the initial high levels of capitalization.

	Number of shares			
	Pre Conversion	Conversion	Post Conversion	Change %
Banc of America	10,121	10,809	20,930	107%
Citigroup	29,056	24,295	53,351	84%
Goldman Sachs	560	279	839	50%
Morgan Stanley	1,546	1,102	2,647	71%
JP Morgan	3,984	2,525	6,509	63%
Wells Fargo	5,268	3,038	8,306	58%
Credit Suisse	1,186	547	1,733	46%
UBS	3,831	1,177	5,008	31%
Deustche Bank	929	823	1,752	88%
Barclays	121,856	135,132	256,988	111%
RBS	1,095,793	1,102,839	2,198,631	101%
Lloyds	681,558	656,180	1,337,737	96%
HSBC	17,707	16,172	33,879	91%
Standard	23,482	14,893	38,375	63%
BNP	1,199	1,189	2,388	99%
Soc Gen	746	721	1,467	97%
Santander	8,440	7,209	15,649	85%
BBVA	4,567	3,601	8,168	79%
Unicredit	19,303	25,519	44,822	132%
ISP	12,655	15,875	28,530	125%
Average	**102,189**	**101,196**	**203,386**	**83.9%**

Source: author

Book value per share also drop by 51% due to double effect of a higher share count and a lower book equity as our post conversion CT1 stays at 8% from the high initial pre conversion levels (above 9% in most cases).

	BV / share			
	Pre Conversio	Conversio n	Post Conversio	Change %
Banc of America	20.9	13.0	9.1	-56.6%
Citigroup	5.6	3.5	2.7	-51.0%
Goldman Sachs	125.7	82.1	75.9	-39.6%
Morgan Stanley	30.6	19.9	16.2	-47.2%
JP Morgan	42.3	26.0	23.1	-45.2%
Wells Fargo	22.3	12.2	12.4	-44.4%
Credit Suisse	28.1	17.0	16.7	-40.6%
UBS	12.2	9.1	8.5	-30.0%
Deustche Bank	52.9	34.3	26.1	-50.7%
Barclays	0.4	0.2	0.2	-60.0%
RBS	0.1	0.0	0.0	-56.7%
Lloyds	0.1	0.0	0.0	-58.0%
HSBC	7.7	4.0	3.4	-56.0%
Standard	1.3	0.6	0.6	-49.2%
BNP	53.2	26.8	24.1	-54.8%
Soc Gen	50.6	28.3	23.5	-53.6%
Santander	8.9	5.3	4.4	-50.4%
BBVA	8.0	4.6	4.1	-48.9%
Unicredit	3.3	2.2	1.3	-60.0%
ISP	4.2	2.7	1.7	-58.6%
Average	**23.9**	**14.6**	**12.7**	**-50.6%**

Source: author

If we assume these heavy losses that trigger the CoCos are one-offs and the normalized earnings remain untouched[140], the ROE climbs up to 24% during the conversion from the pre conversion 14% to finally stay at 16% after losses and CoCos conversion. The ROE should definitely be lower if the CT1 were to be restored to the initial levels but comes in higher owing to the lower post conversion CT1 and hence, lower book equity.

[140] Quite an ambitious assumptions given these losses should dent the normalized earnings via higher cost of funding or lower interest income (and therefore net interest margin should erode), higher provisions etc.

	P/BV			
	Pre Conversi	Conversion	Post Conversi	Change %
Banc of America	0.6x	2.6x	1.8x	182%
Citigroup	0.8x	1.7x	1.2x	46%
Goldman Sachs	1.3x	1.6x	1.1x	-11%
Morgan Stanley	0.9x	1.4x	1.0x	12%
JP Morgan	1.1x	2.7x	1.8x	67%
Wells Fargo	1.4x	3.5x	2.2x	52%
Credit Suisse	1.4x	2.2x	1.5x	6%
UBS	1.4x	1.2x	1.0x	-29%
Deustche Bank	0.8x	1.4x	1.0x	22%
Barclays	0.7x	2.7x	1.7x	140%
RBS	0.7x	1.7x	1.2x	78%
Lloyds	0.9x	3.2x	1.8x	98%
HSBC	0.9x	3.1x	1.9x	119%
Standard	1.3x	3.5x	2.0x	53%
BNP	1.0x	2.9x	1.6x	60%
Soc Gen	0.9x	2.9x	1.8x	93%
Santander	0.9x	3.7x	2.4x	154%
BBVA	1.1x	3.5x	2.2x	102%
Unicredit	0.5x	1.7x	1.2x	127%
ISP	0.5x	1.4x	1.0x	82%
Average	**1.0x**	**2.4x**	**1.6x**	**73%**

Source: author

Same reasoning applies to our P/B equity multiple[141]. It goes up from 1.0x to 2.4x during conversion due to the loss in equity to stabilize at 1.6x. Post conversion P/B comes in at higher levels given the post conversion book equity is much lower than the post conversion market capitalization as share price normalizes once the one off losses are absorbed[142] (See appendix I for details).

[141] See also appendix 9 to observe banks' equity multiples, ROEs, COEs etc as of November 2011. It shows the depressed equity multiples as a result of the acute sovereign and banking crisis.

[142] As the normalized earnings are untouched.

Appendix

1. Bank sample: main valuation metrics

	Main metrics						Solvency									
	Market Cap	Share Price	# shares	Normalized Earnings	Book value Equity	P/B	Tier 1	CT1	Tier 1 levge	B/S levge	RWA	Tier 1 ratio	CT1 ratio	Equity Tier 1	TCE	(TCE+ Allow) / Assets
Banc of America	136,332	13.47	10,121	34,522	211,686	0.6x	163,626	125,139	24%	17.7x	1,455,951	11.2%	8.6%	8.8%	5.9%	7.5%
Citigroup	129,880	4.47	29,056	17,099	162,844	0.8x	140,094	116,202	17%	14.8x	1,086,000	12.9%	10.7%	11.9%	6.9%	8.9%
Goldman Sachs	88,970	158.91	560	7,134	70,399	1.3x	71,000	59,000	17%	13.6x	444,000	16.0%	13.3%	14.6%	7.4%	n.a.
Morgan Stanley	42,010	27.18	1,546	4,255	47,279	0.9x	49,400	38,100	23%	20.4x	299,394	16.5%	12.7%	13.4%	4.9%	n.a.
JP Morgan	185,552	46.58	3,984	27,660	168,306	1.1x	142,845	115,159	19%	18.3x	1,176,329	12.1%	9.8%	9.8%	5.6%	7.0%
Wells Fargo	168,526	31.99	5,268	22,504	117,719	1.4x	89,400	81,300	9%	15.5x	971,700	9.2%	8.4%	8.3%	6.6%	8.3%
Credit Suisse	47,412	39.97	1,186	4,354	33,282	1.4x	37,700	27,715	26%	42.3x	218,702	17.2%	12.7%	11.1%	2.4%	2.5%
UBS	64,704	16.89	3,831	4,208	46,760	1.4x	35,272	30,369	14%	35.7x	198,875	15.0%	15.3%	18.6%	2.8%	2.9%
Deustche Bank	39,104	42.07	929	4,428	49,200	0.8x	42,565	29,972	30%	54.1x	346,057	12.3%	8.7%	10.3%	1.9%	2.0%
Barclays	35,893	0.29	121,856	7,263	50,858	0.7x	53,546	42,861	20%	35.3x	398,031	13.5%	10.8%	10.6%	2.8%	3.7%
RBS	47,097	0.04	1,095,793	7,282	72,058	0.7x	61,000	50,000	18%	27.6x	474,000	12.9%	10.5%	12.1%	3.7%	4.6%
Lloyds	42,209	0.06	681,558	6,868	46,061	0.9x	47,147	41,371	12%	24.5x	406,372	11.6%	10.2%	10.0%	4.1%	7.1%
HSBC	118,123	0.67	177,069	21,803	135,943	0.9x	124,068	106,836	14%	22.4x	1,078,852	11.5%	9.9%	10.0%	4.5%	5.4%
Standard	39,485	1.68	23,482	5,021	29,548	1.3x	29,537	23,704	20%	17.9x	250,422	11.8%	9.5%	9.2%	5.7%	6.1%
BNP	63,826	53.24	1,199	9,173	63,800	1.0x	68,536	65,349	5%	38.1x	633,000	10.8%	10.3%	8.3%	2.6%	4.1%
Soc Gen	34,473	46.19	746	6,078	37,800	0.9x	34,700	28,100	19%	40.4x	333,000	10.4%	8.4%	8.4%	2.5%	3.7%
Santander	70,822	8.39	8,440	16,527	75,019	0.9x	60,489	53,230	12%	24.2x	604,885	10.0%	8.8%	8.3%	4.2%	5.8%
BBVA	39,884	8.73	4,567	7,352	36,689	1.1x	33,023	30,097	9%	19.9x	314,505	10.5%	9.6%	8.9%	5.1%	6.8%
Unicredit	34,301	1.78	19,303	7,232	64,487	0.5x	43,848	39,047	11%	24.9x	453,478	9.7%	8.6%	8.6%	4.1%	7.0%
ISP	28,296	2.24	12,655	4,809	52,528	0.5x	31,680	27,333	14%	23.2x	354,970	8.9%	7.7%	7.8%	4.5%	6.8%
Average							67,974	56,544	17%	26.5x	574,926	12.2%	10.2%	10.5%	4.4%	5.6%

Source: author

	Leverage				Profitability				Valuation			
	Assets/ BV	Assets/ TBV	RWA/ TBV	Hybrids/ Tier 1	ROE	Clean ROE	ROTE	Clean ROTE	Long Run COE	Growth rate	Q4/10 P/B	Norm. P/B
Banc of America	10.7x	17.7x	11.4x	24%	-3%	16%	-5%	27%	8.6%	2.0%	-0.8x	2.2x
Citigroup	11.8x	14.8x	8.4x	17%	3%	11%	4%	12%	10.2%	2.0%	0.1x	1.0x
Goldman Sachs	12.5x	13.6x	6.8x	17%	13%	10%	14%	11%	9.7%	2.0%	1.4x	1.1x
Morgan Stanley	17.3x	20.4x	7.4x	23%	11%	9%	13%	9%	8.2%	2.0%	1.4x	1.1x
JP Morgan	12.6x	18.3x	10.2x	19%	11%	16%	17%	24%	9.5%	2.0%	1.3x	1.9x
Wells Fargo	10.7x	15.5x	12.0x	9%	11%	19%	16%	28%	8.8%	2.0%	1.3x	2.5x
Credit Suisse	31.0x	42.3x	9.0x	26%	10%	13%	14%	18%	9.6%	2.0%	1.1x	1.5x
UBS	28.2x	35.7x	5.4x	14%	7%	9%	9%	10%	8.5%	2.0%	0.8x	1.1x
Deustche Bank	39.1x	54.1x	9.7x	30%	5%	9%	7%	11%	8.6%	2.0%	0.4x	1.1x
Barclays	29.3x	35.3x	9.4x	20%	7%	14%	9%	17%	10.7%	2.0%	0.6x	1.4x
RBS	22.0x	27.6x	8.3x	18%	1%	10%	2%	13%	10.1%	2.0%	-0.1x	1.0x
Lloyds	21.5x	24.5x	10.0x	12%	-4%	15%	-5%	17%	9.7%	2.0%	-0.8x	1.7x
HSBC	17.8x	22.4x	10.0x	14%	10%	16%	13%	20%	10.1%	2.0%	1.0x	1.7x
Standard	13.9x	17.9x	10.9x	20%	15%	17%	19%	22%	8.9%	2.0%	1.8x	2.2x
BNP	31.3x	38.1x	12.1x	5%	10%	14%	12%	17%	8.7%	2.0%	1.2x	1.9x
Soc Gen	29.9x	40.4x	11.9x	19%	9%	16%	12%	22%	9.1%	2.0%	1.0x	2.0x
Santander	16.2x	24.2x	12.0x	12%	11%	22%	17%	33%	9.3%	2.0%	1.3x	2.7x
BBVA	15.2x	19.9x	11.2x	9%	10%	20%	13%	26%	10.3%	2.0%	1.0x	2.2x
Unicredit	15.0x	24.9x	11.7x	11%	2%	11%	3%	19%	9.3%	2.0%	0.0x	1.3x
ISP	12.2x	23.2x	12.9x	14%	4%	9%	7%	17%	9.3%	2.0%	0.3x	1.0x
Average	**19.9x**	**26.5x**	**10.0x**	**17%**	**7%**	**14%**	**9%**	**19%**	**9.3%**	**2.0%**	**0.7x**	**1.6x**

Source: author

2. Individual CoCos conversion analysis

Bank of America	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	211,686	(80,077)	131,609	58,238	189,847
Additions / (Deductions)	(73,371)		(73,371)		(73,371)
Core Tier 1 under Basel III	138,315		58,238		116,476
High Trigger CoCos (50% T1; 50% T2)	36,399		36,399	(36,399)	-
Low Trigger CoCos (50% T1; 50% T2)	43,679		43,679	(21,839)	21,839
MarketCap	136,332		345,219		345,219
RWA	1,455,951		1,455,951		1,455,951
Normalized Earnings	34,522		34,522		34,522
CT1 %	9.5%		4.0%		8.0%
Tier 1 %	12.0%		6.5%		8.0%
Tier 2 %	15.0%		9.5%		9.5%
# shares (000.000)	10,121		10,121	10,809	20,930
BV / share	20.9		13.0		9.1
ROE	16%		26%		18%
P/BV	0.6x		2.6x		1.8x
Share price	**13.5**		**34.1**		**16.5**
Downside %			**153%**		**22%**
Value of CoCos					178,281
Conversion Share Price (40%)	5.4				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	1.5%
Tax at 30%	0%				21,839

Citigroup	Initial Solvency	Initial Solvency	Initial Solvency	Initial Solvency	Initial Solvency
Equity Book Value	162,844	(59,730)	103,114	43,440	146,554
Additions / (Deductions)	(59,674)		(59,674)		(59,674)
Core Tier 1 under Basel III	103,170		43,440		86,880
High Trigger CoCos (50% T1; 50% T2)	27,150		27,150	(27,150)	-
Low Trigger CoCos (50% T1; 50% T2)	32,580		32,580	(16,290)	16,290
MarketCap	129,880		170,986		170,986
RWA	########		1,086,000		1,086,000
Normalized Earnings	17,099		17,099		17,099
CT1 %	9.5%		4.0%		8.0%
Tier 1 %	12.0%		6.5%		8.0%
Tier 2 %	15.0%		9.5%		9.5%
# shares (000.000)	29,056		29,056	24,295	53,351
BV / share	5.6		3.5		2.7
ROE	11%		17%		12%
P/BV	0.8x		1.7x		1.2x
Share price	**4.5**		**5.9**		**3.2**
Downside %			**32%**		**-28%**
Value of CoCos					77,864
Conversion Share Price (40%)	1.8				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	2%
Tax at 30%	0%				16,290

Source: author

Goldman Sachs	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	70,399	(24,420)	45,979	17,760	63,739
Additions / (Deductions)	(28,219)		(28,219)		(28,219)
Core Tier 1 under Basel III	42,180		17,760		35,520
High Trigger CoCos (50% T1; 50% T2)	11,100		11,100	(11,100)	-
Low Trigger CoCos (50% T1; 50% T2)	13,320		13,320	(6,660)	6,660
MarketCap	88,970		71,344		71,344
RWA	444,000		444,000		444,000
Normalized Earnings	7,134		7,134		7,134
CT1 %	9.5%		4.0%		8.0%
Tier 1 %	12.0%		6.5%		8.0%
Tier 2 %	15.0%		9.5%		9.5%
# shares (000.000)	560		560	279	839
BV / share	125.7		82.1		75.9
ROE	10%		16%		11%
P/BV	1.3x		1.6x		1.1x
Share price	**158.9**		**127.4**		**85.0**
Downside %			**-20%**		**-47%**
Value of CoCos					23,751
Conversion Share Price (40%)	63.6				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	2%
Tax at 30%	0%				6,660

Morgan Stanley	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	47,279	(16,467)	30,812	11,976	42,788
Additions / (Deductions)	(18,837)		(18,837)		(18,837)
Core Tier 1 under Basel III	28,442		11,976		23,952
High Trigger CoCos (50% T1; 50% T2)	7,485		7,485	(7,485)	-
Low Trigger CoCos (50% T1; 50% T2)	8,982		8,982	(4,491)	4,491
MarketCap	42,010		42,551		42,551
RWA	299,394		299,394		299,394
Normalized Earnings	4,255		4,255		4,255
CT1 %	9.5%		4.0%		8.0%
Tier 1 %	12.0%		6.5%		8.0%
Tier 2 %	15.0%		9.5%		9.5%
# shares (000.000)	1,546		1,546	1,102	2,647
BV / share	30.6		19.9		16.2
ROE	9%		14%		10%
P/BV	0.9x		1.4x		1.0x
Share price	**27.2**		**27.5**		**16.1**
Downside %			**1%**		**-41%**
Value of CoCos					17,706
Conversion Share Price (40%)	10.9				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	2%
Tax at 30%	0%				4,491

Source: author

JP Morgan	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	168,306	(64,698)	103,608	47,053	150,661
Additions / (Deductions)	(56,555)		(56,555)		(56,555)
Core Tier 1 under Basel III	111,751		47,053		94,106
High Trigger CoCos (50% T1; 50% T2)	29,408		29,408	(29,408)	-
Low Trigger CoCos (50% T1; 50% T2)	35,290		35,290	(17,645)	17,645
MarketCap	185,552		276,595		276,595
RWA	1,176,329		1,176,329		1,176,329
Normalized Earnings	27,660		27,660		27,660
QUITY					
CT1 %	9.5%		4.0%		8.0%
Tier 1 %	12.0%		6.5%		8.0%
Tier 2 %	15.0%		9.5%		9.5%
# shares (000.000)	3,984		3,984	2,525	6,509
BV / share	42.3		26.0		23.1
ROE	16%		27%		18%
P/BV	1.1x		2.7x		1.8x
Share price	**46.6**		**69.4**		**42.5**
Downside %			**49%**		**-9%**
Value of CoCos					107,316
Conversion Share Price (40%)	18.6				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	2%
Tax at 30%	0%				17,645

Wells Fargo	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	117,719	(53,444)	64,276	38,868	103,144
Additions / (Deductions)	(25,408)		(25,408)		(25,408)
Core Tier 1 under Basel III	92,312		38,868		77,736
High Trigger CoCos (50% T1; 50% T2)	24,293		24,293	(24,293)	-
Low Trigger CoCos (50% T1; 50% T2)	29,151		29,151	(14,576)	14,576
MarketCap	168,526		225,042		225,042
RWA	971,700		971,700		971,700
Normalized Earnings	22,504		22,504		22,504
CT1 %	9.5%		4.0%		8.0%
Tier 1 %	12.0%		6.5%		8.0%
Tier 2 %	15.0%		9.5%		9.5%
# shares (000.000)	5,268		5,268	3,038	8,306
BV / share	22.3		12.2		12.4
ROE	19%		35%		22%
P/BV	1.4x		3.5x		2.2x
Share price	**32.0**		**42.7**		**27.1**
Downside %			**34%**		**-15%**
Value of CoCos					82,302
Conversion Share Price (40%)	12.8				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	2%
Tax at 30%	0%				14,576

Source: author

Credit Suisse	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	33,282	(13,122)	20,160	8,748	28,908
Additions / (Deductions)	(11,412)		(11,412)		(11,412)
Core Tier 1 under Basel III	21,870		8,748		17,496
High Trigger CoCos (50% T1; 50% T2)	6,561		6,561	(6,561)	-
Low Trigger CoCos (50% T1; 50% T2)	13,122		13,122	(2,187)	10,935
MarketCap	47,412		43,543		43,543
RWA	218,702		218,702		218,702
Normalized Earnings	4,354		4,354		4,354
CT1 %	10.0%		4.0%		8.0%
Tier 1 %	13.0%		7.0%		8.0%
Tier 2 %	19.0%		13.0%		13.0%
# shares (000.000)	1,186		1,186	547	1,733
BV / share	28.1		17.0		16.7
ROE	13%		22%		15%
P/BV	1.4x		2.2x		1.5x
Share price	**40.0**		**36.7**		**25.1**
Downside %			**-8%**		**-37%**
Value of CoCos					13,745
Conversion Share Price (40%)	16.0				
CT1 after initial losses	4.0%			CT1	0.07
CT1 to be raised to	8.0%			TO 8%	1%
Tax at 30%	0%				2,187

UBS	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	46,760	(11,933)	34,828	7,955	42,783
Additions / (Deductions)	(26,873)		(26,873)		(26,873)
Core Tier 1 under Basel III	19,888		7,955		15,910
High Trigger CoCos (50% T1; 50% T2)	5,966		5,966	(5,966)	-
Low Trigger CoCos (50% T1; 50% T2)	11,933		11,933	(1,989)	9,944
MarketCap	64,704		42,084		42,084
RWA	198,875		198,875		198,875
Normalized Earnings	4,208		4,208		4,208
CT1 %	10.0%		4.0%		8.0%
Tier 1 %	13.0%		7.0%		8.0%
Tier 2 %	19.0%		13.0%		13.0%
# shares (000.000)	3,831		3,831	1,177	5,008
BV / share	12.2		9.1		8.5
ROE	9%		12%		10%
P/BV	1.4x		1.2x		1.0x
Share price	**16.9**		**11.0**		**8.4**
Downside %			**-35%**		**-50%**
Value of CoCos					9,894
Conversion Share Price (40%)	6.8				
CT1 after initial losses	4.0%			CT1	0.07
CT1 to be raised to	8.0%			TO 8%	1%
Tax at 30%	0%				1,989

Source: author

Deutsche Bank	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	49,200	(17,303)	31,897	13,842	45,739
Additions / (Deductions)	(18,055)		(18,055)		(18,055)
Core Tier 1 under Basel III	31,145		13,842		27,685
High Trigger CoCos (50% T1; 50% T2)	8,651		8,651	(8,651)	-
Low Trigger CoCos (50% T1; 50% T2)	10,382		10,382	(5,191)	5,191
MarketCap	39,104		44,280		44,280
RWA	346,057		346,057		346,057
Normalized Earnings	4,428		4,428		4,428
CT1 %	9.0%		4.0%		8.0%
Tier 1 %	11.5%		6.5%		8.0%
Tier 2 %	14.5%		9.5%		9.5%
# shares (000.000)	929		929	823	1,752
BV / share	52.9		34.3		26.1
ROE	9%		14%		10%
P/BV	0.8x		1.4x		1.0x
Share price	**42.1**		**47.6**		**25.3**
Downside %			**13%**		**-40%**
Value of CoCos					20,789
Conversion Share Price (40%)	16.8				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	2%
Tax at 30%	0%				5,191

Barclays	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	50,858	(23,882)	26,976	15,921	42,897
Additions / (Deductions)	(11,055)		(11,055)		(11,055)
Core Tier 1 under Basel III	39,803		15,921		31,842
High Trigger CoCos (50% T1; 50% T2)	9,951		9,951	(9,951)	-
Low Trigger CoCos (50% T1; 50% T2)	11,941		11,941	(5,970)	5,970
MarketCap	35,893		72,630		72,630
RWA	398,031		398,031		398,031
Normalized Earnings	7,263		7,263		7,263
CT1 %	10.0%		4.0%		8.0%
Tier 1 %	12.5%		6.5%		8.0%
Tier 2 %	15.5%		9.5%		9.5%
# shares (000.000)	121,856		121,856	135,132	256,988
BV / share	0.4		0.2		0.2
ROE	14%		27%		17%
P/BV	0.7x		2.7x		1.7x
Share price	**0.3**		**0.6**		**0.3**
Downside %			**102%**		**-4%**
Value of CoCos					38,191
Conversion Share Price (40%)	0.1				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	2%
Tax at 30%	0%				5,970

Source: author

RBS	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	72,058	(28,440)	43,618	18,960	62,578
Additions / (Deductions)	(24,658)		(24,658)		(24,658)
Core Tier 1 under Basel III	47,400		18,960		37,920
High Trigger CoCos (50% T1; 50% T2)	11,850		11,850	(11,850)	-
Low Trigger CoCos (50% T1; 50% T2)	14,220		14,220	(7,110)	7,110
MarketCap	47,097		72,818		72,818
RWA	474,000		474,000		474,000
Normalized Earnings	7,282		7,282		7,282
CT1 %	10.0%		4.0%		8.0%
Tier 1 %	12.5%		6.5%		8.0%
Tier 2 %	15.5%		9.5%		9.5%
# shares (000.000)	1,095,793		1,095,793	########	2,198,631
BV / share	0.1		0.0		0.0
ROE	10%		17%		12%
P/BV	0.7x		1.7x		1.2x
Share price	**0.0**		**0.1**		**0.0**
Downside %			**55%**		**-23%**
Value of CoCos					36,526

Conversion Share Price (40%)	0.0		
CT1 after initial losses	4.0%	CT1	0.065
CT1 to be raised to	8.0%	TO 8%	2%
Tax at 30%	0%		7,110

Lloyds	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	46,061	(24,382)	21,679	16,255	37,934
Additions / (Deductions)	(5,424)		(5,424)		(5,424)
Core Tier 1 under Basel III	40,637		16,255		32,510
High Trigger CoCos (50% T1; 50% T2)	10,159		10,159	(10,159)	-
Low Trigger CoCos (50% T1; 50% T2)	12,191		12,191	(6,096)	6,096
MarketCap	42,209		68,684		68,684
RWA	406,372		406,372		406,372
Normalized Earnings	6,868		6,868		6,868
CT1 %	10.0%		4.0%		8.0%
Tier 1 %	12.5%		6.5%		8.0%
Tier 2 %	15.5%		9.5%		9.5%
# shares (000.000)	681,558		681,558	656,180	1,337,737
BV / share	0.1		0.0		0.0
ROE	15%		32%		18%
P/BV	0.9x		3.2x		1.8x
Share price	**0.1**		**0.1**		**0.1**
Downside %			**63%**		**-17%**
Value of CoCos					33,690

Conversion Share Price (40%)	0.0		
CT1 after initial losses	4.0%	CT1	0.065
CT1 to be raised to	8.0%	TO 8%	2%
Tax at 30%	0%		6,096

Source: author

HSBC	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	135,943	(64,731)	71,212	43,154	114,366
Additions / (Deductions)	(28,058)		(28,058)		(28,058)
Core Tier 1 under Basel III	107,885		43,154		86,308
High Trigger CoCos (50% T1; 50% T2)	26,971		26,971	(26,971)	-
Low Trigger CoCos (50% T1; 50% T2)	32,366		32,366	(16,183)	16,183
MarketCap	118,123		218,027		218,027
RWA	1,078,852		1,078,852		1,078,852
Normalized Earnings	21,803		21,803		21,803
CT1 %	10.0%		4.0%		8.0%
Tier 1 %	12.5%		6.5%		8.0%
Tier 2 %	15.5%		9.5%		9.5%
# shares (000.000)	177,069		177,069	161,723	338,792
BV / share	0.8		0.4		0.3
ROE	16%		31%		19%
P/BV	0.9x		3.1x		1.9x
Share price	**0.7**		**1.2**		**0.6**
Downside %			**85%**		**-4%**
Value of CoCos					104,075

Conversion Share Price (40%)	0.3		
CT1 after initial losses	4.0%	CT1	0.065
CT1 to be raised to	8.0%	TO 8%	2%
Tax at 30%	0%		16,183

Standard Chartered	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	29,548	(15,025)	14,523	10,017	24,540
Additions / (Deductions)	(4,506)		(4,506)		(4,506)
Core Tier 1 under Basel III	25,042		10,017		20,034
High Trigger CoCos (50% T1; 50% T2)	6,261		6,261	(6,261)	-
Low Trigger CoCos (50% T1; 50% T2)	7,513		7,513	(3,756)	3,756
MarketCap	39,485		50,205		50,205
RWA	250,422		250,422		250,422
Normalized Earnings	5,021		5,021		5,021
CT1 %	10.0%		4.0%		8.0%
Tier 1 %	12.5%		6.5%		8.0%
Tier 2 %	15.5%		9.5%		9.5%
# shares (000.000)	23,482		23,482	14,893	38,375
BV / share	1.3		0.6		0.6
ROE	17%		35%		20%
P/BV	1.3x		3.5x		2.0x
Share price	**1.7**		**2.1**		**1.3**
Downside %			**27%**		**-22%**
Value of CoCos					19,484

Conversion Share Price (40%)	0.7		
CT1 after initial losses	4.0%	CT1	0.065
CT1 to be raised to	8.0%	TO 8%	2%
Tax at 30%	0%		3,756

Source: author

BNP Paribas	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	63,800	(31,650)	32,150	25,320	57,470
Additions / (Deductions)	(6,830)		(6,830)		(6,830)
Core Tier 1 under Basel III	56,970		25,320		50,640
High Trigger CoCos (50% T1; 50% T2)	15,825		15,825	(15,825)	-
Low Trigger CoCos (50% T1; 50% T2)	18,990		18,990	(9,495)	9,495
MarketCap	63,826		91,728		91,728
RWA	633,000		633,000		633,000
Normalized Earnings	9,173		9,173		9,173
CT1 %	9.0%		4.0%		8.0%
Tier 1 %	11.5%		6.5%		8.0%
Tier 2 %	14.5%		9.5%		9.5%
# shares (000.000)	1,199		1,199	1,189	2,388
BV / share	53.2		26.8		24.1
ROE	14%		29%		16%
P/BV	1.0x		2.9x		1.6x
Share price	**53.2**		**76.5**		**38.4**
Downside %			**44%**		**-28%**
Value of CoCos					45,674

Conversion Share Price (40%)	21.3		
CT1 after initial losses	4.0%	CT1	0.065
CT1 to be raised to	8.0%	TO 8%	2%
Tax at 30%	0%		9,495

Societe Generale	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	37,800	(16,650)	21,150	13,320	34,470
Additions / (Deductions)	(7,830)		(7,830)		(7,830)
Core Tier 1 under Basel III	29,970		13,320		26,640
High Trigger CoCos (50% T1; 50% T2)	8,325		8,325	(8,325)	-
Low Trigger CoCos (50% T1; 50% T2)	9,990		9,990	(4,995)	4,995
MarketCap	34,473		60,778		60,778
RWA	333,000		333,000		333,000
Normalized Earnings	6,078		6,078		6,078
CT1 %	9.0%		4.0%		8.0%
Tier 1 %	11.5%		6.5%		8.0%
Tier 2 %	14.5%		9.5%		9.5%
# shares (000.000)	746		746	721	1,467
BV / share	50.6		28.3		23.5
ROE	16%		29%		18%
P/BV	0.9x		2.9x		1.8x
Share price	**46.2**		**81.4**		**41.4**
Downside %			**76%**		**-10%**
Value of CoCos					29,863

Conversion Share Price (40%)	18.5		
CT1 after initial losses	4.0%	CT1	0.065
CT1 to be raised to	8.0%	TO 8%	2%
Tax at 30%	0%		4,995

Source: author

Santander	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	75,019	(30,244)	44,775	24,195	68,970
Additions / (Deductions)	(20,579)		(20,579)		(20,579)
Core Tier 1 under Basel III	54,440		24,195		48,391
High Trigger CoCos (50% T1; 50% T2)	15,122		15,122	(15,122)	-
Low Trigger CoCos (50% T1; 50% T2)	18,147		18,147	(9,073)	9,073
MarketCap	70,822		165,274		165,274
RWA	604,885		604,885		604,885
Normalized Earnings	16,527		16,527		16,527
CT1 %	9.0%		4.0%		8.0%
Tier 1 %	11.5%		6.5%		8.0%
Tier 2 %	14.5%		9.5%		9.5%
# shares (000.000)	8,440		8,440	7,209	15,649
BV / share	8.9		5.3		4.4
ROE	22%		37%		24%
P/BV	0.9x		3.7x		2.4x
Share price	**8.4**		**19.6**		**10.6**
Downside %			**133%**		**26%**
Value of CoCos					76,134

Conversion Share Price (40%)	3.4		
CT1 after initial losses	4.0%	CT1	0.065
CT1 to be raised to	8.0%	TO 8%	2%
Tax at 30%	0%		9,073

BBVA	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	36,689	(15,725)	20,964	12,580	33,544
Additions / (Deductions)	(8,384)		(8,384)		(8,384)
Core Tier 1 under Basel III	28,305		12,580		25,160
High Trigger CoCos (50% T1; 50% T2)	7,863		7,863	(7,863)	-
Low Trigger CoCos (50% T1; 50% T2)	9,435		9,435	(4,718)	4,718
MarketCap	39,884		73,524		73,524
RWA	314,505		314,505		314,505
Normalized Earnings	7,352		7,352		7,352
CT1 %	9.0%		4.0%		8.0%
Tier 1 %	11.5%		6.5%		8.0%
Tier 2 %	14.5%		9.5%		9.5%
# shares (000.000)	4,567		4,567	3,601	8,168
BV / share	8.0		4.6		4.1
ROE	20%		35%		22%
P/BV	1.1x		3.5x		2.2x
Share price	**8.7**		**16.1**		**9.0**
Downside %			**84%**		**3%**
Value of CoCos					32,416

Conversion Share Price (40%)	3.5		
CT1 after initial losses	4.0%	CT1	0.065
CT1 to be raised to	8.0%	TO 8%	2%
Tax at 30%	0%		4,718

Source: author

Unicredit	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	64,487	(22,674)	41,813	18,139	59,952
Additions / (Deductions)	(23,674)		(23,674)		(23,674)
Core Tier 1 under Basel III	40,813		18,139		36,278
High Trigger CoCos (50% T1; 50% T2)	11,337		11,337	(11,337)	-
Low Trigger CoCos (50% T1; 50% T2)	13,604		13,604	(6,802)	6,802
MarketCap	34,301		72,324		72,324
RWA	453,478		453,478		453,478
Normalized Earnings	7,232		7,232		7,232
CT1 %	9.0%		4.0%		8.0%
Tier 1 %	11.5%		6.5%		8.0%
Tier 2 %	14.5%		9.5%		9.5%
# shares (000.000)	19,303		19,303	25,519	44,822
BV / share	3.3		2.2		1.3
ROE	11%		17%		12%
P/BV	0.5x		1.7x		1.2x
Share price	**1.8**		**3.7**		**1.6**
Downside %			**111%**		**-9%**
Value of CoCos					41,177
Conversion Share Price (40%)	0.7				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	2%
Tax at 30%	0%				6,802

ISP	Initial Solvency	Post Tax Loss	Solvency post loss	Conversion	Solvency post conversion
Equity Book Value	52,528	(17,749)	34,780	14,199	48,978
Additions / (Deductions)	(20,581)		(20,581)		(20,581)
Core Tier 1 under Basel III	31,947		14,199		28,398
High Trigger CoCos (50% T1; 50% T2)	8,874		8,874	(8,874)	-
Low Trigger CoCos (50% T1; 50% T2)	10,649		10,649	(5,325)	5,325
MarketCap	28,296		48,091		48,091
RWA	354,970		354,970		354,970
Normalized Earnings	4,809		4,809		4,809
CT1 %	9.0%		4.0%		8.0%
Tier 1 %	11.5%		6.5%		8.0%
Tier 2 %	14.5%		9.5%		9.5%
# shares (000.000)	12,655		12,655	15,875	28,530
BV / share	4.2		2.7		1.7
ROE	9%		14%		10%
P/BV	0.5x		1.4x		1.0x
Share price	**2.2**		**3.8**		**1.7**
Downside %			**70%**		**-25%**
Value of CoCos					26,760
Conversion Share Price (40%)	0.9				
CT1 after initial losses	4.0%			CT1	0.065
CT1 to be raised to	8.0%			TO 8%	2%
Tax at 30%	0%				5,325

Source: author

3. Core Tier 1 Adjustments

- Deferred Tax Assets: DTAs resulting from net tax loss carry forwards (profit dependent) are deducted from CT1. DTAs from timing differences are only deducted from CT1 if they exceed 10% of CT1
- Investments in non-consolidated financials: Includes holdings of insurance companies (also majority shareholdings) and investments in other financial institutions (between 10 and 50% ownership). Only deducted from Core Tier 1 if they exceed 10% of Core Tier 1
- Mortgage servicing rights: No longer eligible as capital. Not material for European banks

These three items are only allowed up to 10% of CT1 individually or 15% in total:

- Minority interest: For genuine operating banking subsidiaries, only the "excess capital" attributable to minority shareholders is deducted. Minority interest in subsidiaries which are not banks are to be deducted
- AFS reserve: Unrealized losses are to be deducted. Committee has yet to confirm treatment of unrealized gains. Potential mitigating impact from IAS 9 and pull-to-par.
- Other: All deduction currently taken 50% from Tier 1 and 50% from Total Capital are to be fully deducted from Core Tier 1 Capital (e.g. expected loss). Defined benefit pension fund asset should be deducted from Core Tier 1. First loss positions 1250% risk weighted

4. Criteria for new Basel III compliant Tier I and II instruments

According to Basel Press release and Goldman Sachs, the criteria for inclusion in Additional Tier I and Tier II Capital is as follows:

Tier II

- Issued externally and fully paid in, without the bank funding the purchase, subordinated to depositors, creditors and subordinated debt, neither secured nor covered.
- Perpetual, no incentives to redeem, callable earliest in Year 5.
    - Supervisory approval to call, and bank must not do anything to create expectation that the call will be exercised.
    - Bank must not call the instrument unless replacement at conditions sustainable for the income capacity of the bank and the bank is well above minimum capital requirements.

- Non-cumulative discretionary coupons paid out of distributable items only
    - Full discretion required, i.e. prohibition of "dividend pushers". Cancelation must not impose restrictions on bank except in distributions to common shareholders (i.e. "stopper").
- Instrument cannot contribute to "liabilities exceeding assets" test if such balance sheet test is part of national insolvency law.
- Only instruments that are classified as liabilities for accounting purposes must have principal loss absorption through conversion to common / write down at a pre-specified trigger point.
    - Write down will have to reduce claim in liquidation, the amount repaid when call is exercised and partially / fully reduce coupons (i.e. "permanent").
- No features that hinder recapitalization and no credit sensitive dividend feature that reset based on bank's credit standing.
- SPV issue requires proceeds to be available immediately and without limitation in a form that meets or exceeds Additional Tier I capital criteria.

Tier II

- Issued externally and fully paid in, without the bank funding the purchase, subordinated to depositors, creditors, neither secured nor covered.
- Minimum 5 years maturity.
    - No step-ups allowed and straight line amortization in last 5 years.
    - Requirements for calling same as for Additional Tier I capital.
- No credit sensitive dividend feature, SPV on-loan needs to meet Tier II criteria.

In general dividend-pushers prohibited, stoppers allowed if don't hinder recapitalization. Equity accounted instruments does not require principal loss absorption (conversion / permanent write down). SPV Tier I transaction requires on-loan in Tier I format. Still no further guidance regarding the loss absorption requirement upon non-viability for Tier I / Tier II.

5 New Basel III ratios

5.1 Leverage ratio

This ratio will require banks to hold T1 capital equal or above 3% of the unweighted assets (all assets in the balance sheet on a nominal basis). It will remain in a test phase until the end of 2017. This allows to set another cap in terms of leverage even if the bank's assets are low risk weighted.

5.2 Net Stable Funding Ratio (NSFR)

It aims to measure long term, stable sources of funding versus the liquidity of the assets funded and might-be funding needs from the off balance sheet commitments. The ratio is:

Available Stable Funding (ASF) / Required Stable Funding (RSF) > 100%

This ratio aims to ensure that the funding matches the assets as accurately as possible and forces the bank to hold at least long term funding that tallies well with the long term assets.

ASF will be made up of:

- Capital (after deductions)
- Preference stock (maturity>1yr)
- Liabilities (maturity>1yr)
- Stable / "sticky" deposits in a stress period
- Wholesale funding below a year than can stay in the bank in a stress period.

The ASF factor (0%-100%) weights each asset class (100% for equity; 90% stable deposits; 50% unsecured debt, etc).

The RSF measures the assets of the balance sheet The RSF factor (0%-100%) indicates the amount of an asset which cannot be monetized[143] during a liquidity "shortfall" over a year. Any encumbered asset will get a 100% unless it is below a year.

5.3 Liquidity Coverage Ratio (LCR)

It assesses the liquidity capacity of a bank under a severe short term liquidity squeeze over 30 days. The ratio is:

[143] Through sales or used as collateral.

High Quality Liquid Assets (HQLA) / Net Cash Outflows (NCO) Over 30 days>100%

HQLA must trade in an active repo or cash market and be available in a stressed scenario. There are two levels:

- Level 1: bank can hold unlimited amounts at market value with no haircuts. These are:
  - Cash and central bank reserves.
  - 0% risk weighted sovereign central bank, public sector enterprise etc.
  - Non 0% risk weighted sovereign debt in domestic currency or in foreign currency matching the currency needs of the bank in this country.

- Level 2 can only represent 40% of the pool and have a minimum 15% haircut of market value
  - 20% risk weighted sovereign, central bank, public sector enterprise etc.
  - Covered bonds and non-financial corporate bonds rated AA- or above[144].

NCO is calculated as follows:

NCO = outflows – minimum of (inflows, 75% of outflows)

Expected outflow are estimated by using a run off rate over the liabilities and off balance sheet commitments. The total expected inflows are calculated by applying a rate (at which they could flow) on the outstanding contractual receivables. With this ratio, the regulator aims to ensure that the bank is covered at least for the 25% of its gross outflows.

6 Phasing in arrangements

Below the phase-in schedule for the new solvency ratios and buffers, leverage and liquidity ratios.

Annex 2: Phase-in arrangements (shading indicates transition periods)

(all dates are as of 1 January)

	2011	2012	2013	2014	2015	2016	2017	2018	As of 1 January 2019
Leverage Ratio	Supervisory monitoring		Parallel run 1 Jan 2013 – 1 Jan 2017 Disclosure starts 1 Jan 2015					Migration to Pillar 1	
Minimum Common Equity Capital Ratio			3.5%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital Conservation Buffer						0.625%	1.25%	1.875%	2.50%
Minimum common equity plus capital conservation buffer			3.5%	4.0%	4.5%	5.125%	5.75%	6.375%	7.0%
Phase-in of deductions from CET1 (including amounts exceeding the limit for DTAs, MSRs and financials)				20%	40%	60%	80%	100%	100%
Minimum Tier 1 Capital			4.5%	5.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Minimum Total Capital			8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Minimum Total Capital plus conservation buffer			8.0%	8.0%	8.0%	8.625%	9.25%	9.875%	10.5%
Capital instruments that no longer qualify as non-core Tier 1 capital or Tier 2 capital			Phased out over 10 year horizon beginning 2013						

Liquidity coverage ratio	Observation period begins				Introduce minimum standard				
Net stable funding ratio		Observation period begins						Introduce minimum standard	

Source: Bank of International Settlements

[144]Senior and lower rated corporate debt do not qualify

Existing bank capital instruments that no longer qualify as Tier I Capital or Tier II Capital under Basel III will be phased out starting 1- Jan-2013. Fixing the base at the nominal amount of such instruments outstanding as of 1-Jan-2013, their recognition is be capped at 90% from 1-Jan-2013. The cap is reduced by 10% in each subsequent year until 2019. This cap will be applied to Tier I and Tier II instruments separately and refers to the total amount of instruments outstanding that no longer meet the relevant entry criteria. To the extent an instrument is redeemed, or its recognition in capital is amortized, after 1-Jan-2013, the nominal amount serving as the base for calculation is not reduced. Following Goldman Sachs (2010), the instruments with an incentive to be redeemed will be treated as follows:

Call & Step-up Date?	Basel III Eligible?	Capital Treatment
Between 12-Sep-2010 and 1-Jan-2013	No	■ Derecognized from capital starting from 1-Jan-2013
After 1-Jan-2013	No	■ Phased out from 1-Jan-2013 until the step-up date ■ Derecognized from capital starting from the step-up date
Prior to 12-Sep-2010	No	■ Phased out from 1-Jan-2013
Prior to 1-Jan-2013	Yes	■ Remains eligible as capital
After 1-Jan-2013	Yes	■ Phased out from 1-Jan-2013 until the step-up date ■ Remain eligible as capital starting from the step-up date

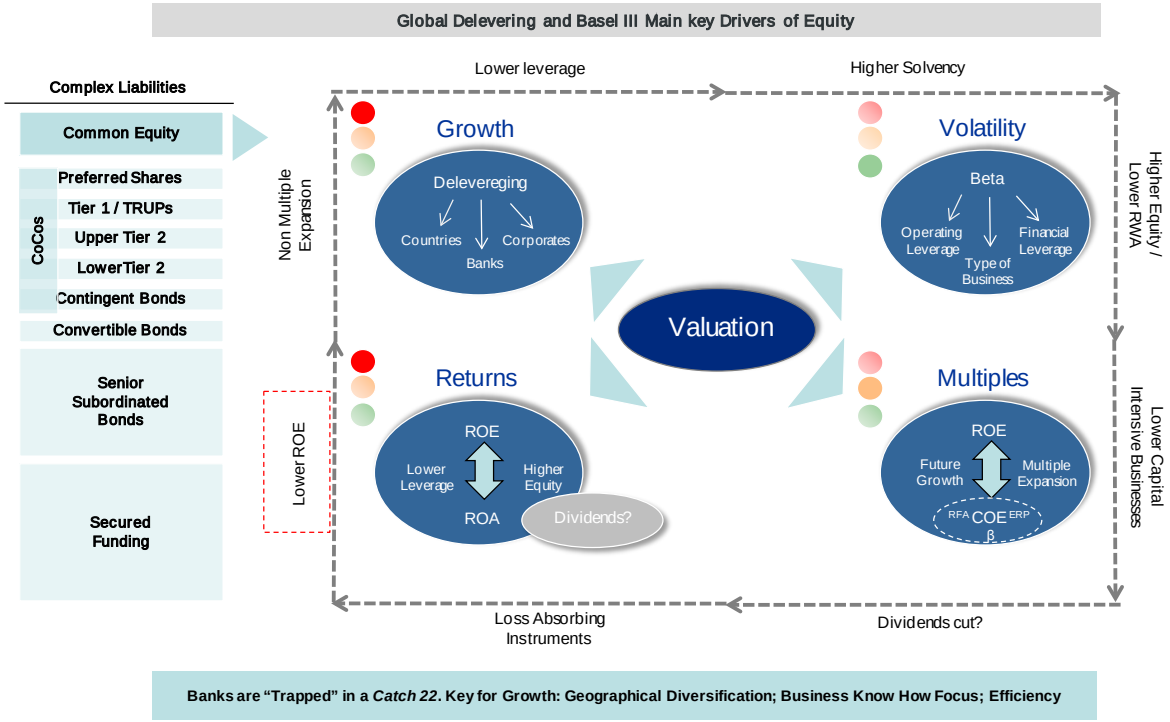
Source: Goldman Sachs Research team

7. ROA vs ROE and implied valuation in European Financial Equities

	ROE / P/B Analysis												ROA Analysis				
Bank	Market cap	Equity	Q1 P/BV	Q1 ROE	Consensus 2013 ROTE target	COE	Perp G Rate	Market Implied ROE	Q1 Implied P/B	Premium/ (Discount)	2013 Implied P/B	Premium/ (Discount)	Q1 ROA	Leverage ratio	Target 2013 Lev ratio	Implied 2013 ROA based on 2013 ROE	Necessary ROA adjutment
UK Banks																	
BARCLAYS PLC	30,166	62,262	0.5x	3.6%	10%	11.8%	3.0%	7.3%	0.6x	27%	0.8x	72%	0.2%	23.9x	25.0x	0.4%	171 bps
HSBC HOLDINGS PLC	109,096	154,915	0.7x	8.3%	13%	9.2%	4.0%	7.7%	0.8x	18%	1.8x	156%	0.5%	15.8x	25.0x	0.5%	3 bps
LLOYDS BANKING GROUP PLC	30,442	46,902	0.6x	-3.9%	11%	11.6%	3.0%	8.6%	0.7x	14%	1.0x	48%	-0.2%	21.1x	25.0x	0.5%	500 bps
ROYAL BANK OF SCOTLAND GROUP	40,206	76,851	0.5x	-3.0%	8%	11.1%	3.0%	7.3%	0.7x	25%	0.7x	26%	-0.2%	18.9x	25.0x	0.3%	400 bps
STANDARD CHARTERED PLC	38,134	38,865	1.0x	11.2%	13%	10.1%	5.0%	10.0%	1.0x	1%	1.7x	69%	0.8%	13.3x	25.0x	0.5%	-37 bps
Germany Banks																	
AAREAL BANK AG	1,340	1,997	0.7x	6.0%	9%	10.1%	3.0%	7.7%	0.8x	15%	0.8x	25%	0.3%	20.0x	25.0x	0.4%	19 bps
COMMERZBANK AG	3,972	13,191	0.3x	29.9%	12%	8.8%	3.0%	4.8%	0.5x	79%	1.5x	397%	0.6%	52.8x	25.0x	0.5%	-17 bps
DEUTSCHE BANK AG-REGISTERED	24,946	51,590	0.5x	16.0%	12%	9.3%	3.0%	6.0%	0.7x	35%	1.4x	192%	0.4%	35.7x	25.0x	0.5%	6 bps
Swiss Banks																	
CREDIT SUISSE GROUP AG-REG	38,816	43,288	0.9x	10.5%	16%	8.6%	3.0%	8.0%	0.9x	4%	2.3x	154%	0.4%	23.5x	25.0x	0.6%	40 bps
UBS AG-REG	57,706	51,842	1.1x	13.9%	15%	9.6%	3.0%	10.3%	1.1x	(3%)	1.8x	58%	0.6%	24.9x	25.0x	0.6%	4 bps
Dutch banks																	
ING GROEP NV-CVA	30,974	45,809	0.7x	12.1%	13%	12.5%	3.0%	9.4%	0.8x	11%	1.0x	48%	0.4%	26.8x	25.0x	0.5%	11 bps
KBC GROEP NV	9,136	18,531	0.5x	17.7%	16%	14.5%	3.0%	8.7%	0.6x	21%	1.1x	120%	1.0%	17.4x	25.0x	0.6%	-39 bps
SNS REAAL	854	4,833	0.2x	-9.6%	6%	7.2%	3.0%	3.7%	0.5x	195%	0.7x	283%	-0.4%	26.4x	25.0x	0.2%	200 bps
Spanish and Portuguese Banks																	
BANCO SANTANDER SA	65,564	79,753	0.8x	10.6%	14%	12.8%	3.0%	11.1%	0.9x	5%	1.1x	32%	0.7%	14.2x	25.0x	0.5%	-27 bps
BANCO BILBAO VIZCAYA ARGENTA	35,839	37,881	0.9x	12.1%	14%	13.0%	3.0%	12.5%	1.0x	1%	1.1x	17%	0.8%	14.8x	25.0x	0.6%	-31 bps
BANCO POPULAR ESPANOL	5,294	8,700	0.6x	8.5%	8%	12.0%	3.0%	8.5%	0.7x	16%	0.6x	(0%)	0.6%	14.8x	25.0x	0.3%	-41 bps
BANCO ESP CREDITO (BANESTO)	3,555	5,584	0.6x	12.1%	10%	11.1%	3.0%	8.2%	0.7x	15%	0.9x	35%	0.6%	20.2x	25.0x	0.4%	-34 bps
BANCO DE SABADELL SA	3,913	6,650	0.6x	5.1%	8%	11.0%	3.0%	7.7%	0.7x	19%	0.6x	2%	0.4%	14.3x	25.0x	0.3%	-11 bps
BANKINTER SA	2,144	2,705	0.8x	7.2%	9%	11.8%	3.0%	9.9%	0.8x	7%	0.6x	(20%)	0.4%	20.1x	25.0x	0.3%	-4 bps
BANCO PASTOR	800	1,615	0.5x	7.0%	7%	8.8%	3.0%	5.9%	0.7x	35%	0.7x	49%	0.4%	19.0x	25.0x	0.3%	-20 bps
BANCO COMERCIAL PORTUGUES-R	2,804	7,207	0.4x	4.3%	6%	17.8%	3.0%	8.8%	0.5x	26%	0.2x	(41%)	0.3%	13.4x	25.0x	0.3%	-20 bps
BANCO ESPIRITO SANTO-REG	2,899	7,361	0.4x	3.3%	6%	17.8%	3.0%	8.8%	0.5x	26%	0.2x	(42%)	0.3%	11.0x	25.0x	0.3%	-15 bps
BANCO BPI SA.- REG SHS	955	1,940	0.5x	9.3%	10%	17.2%	3.0%	10.0%	0.6x	18%	0.5x	3%	0.4%	22.8x	25.0x	0.4%	-1 bps
Italian Banks																	
UNICREDIT SPA	27,437	68,187	0.4x	4.8%	7%	12.7%	3.0%	6.9%	0.5x	35%	0.4x	12%	0.4%	13.4x	25.0x	0.3%	-17 bps
INTESA SANPAOLO	29,172	55,463	0.5x	4.8%	7%	12.3%	3.0%	7.9%	0.6x	22%	0.5x	(11%)	0.4%	11.6x	25.0x	0.3%	-28 bps
BANCA MONTE DEI PASCHI SIENA	5,625	17,770	0.3x	3.2%	6%	11.0%	3.0%	5.5%	0.5x	59%	0.4x	12%	0.2%	13.1x	25.0x	0.2%	-3 bps
BANCO POPOLARE SCARL	2,691	11,940	0.2x	2.0%	5%	11.4%	3.0%	4.9%	0.4x	91%	0.2x	(4%)	0.2%	11.3x	25.0x	0.2%	8 bps
BANCA CARIGE SPA	2,850	3,879	0.7x	3.8%	6%	10.0%	3.0%	8.1%	0.8x	11%	0.4x	(42%)	0.4%	10.4x	25.0x	0.2%	-34 bps
French Banks																	
BNP PARIBAS	62,363	85,630	0.7x	12.2%	13%	10.5%	3.0%	8.5%	0.8x	11%	1.3x	78%	0.5%	23.3x	25.0x	0.5%	-2 bps
CREDIT AGRICOLE SA	25,304	52,800	0.5x	7.6%	11%	11.2%	3.0%	6.9%	0.6x	29%	0.9x	93%	0.3%	29.9x	25.0x	0.4%	67 bps
DEXIA SA	4,034	11,453	0.4x	2.4%	8%	11.7%	3.0%	6.1%	0.5x	47%	0.6x	72%	0.1%	46.0x	25.0x	0.3%	531 bps
NATIXIS	9,766	21,366	0.5x	7.7%	9%	11.3%	3.0%	6.8%	0.6x	32%	0.8x	66%	0.4%	21.4x	25.0x	0.4%	3 bps
SOCIETE GENERALE	30,559	51,800	0.6x	7.1%	12%	11.2%	3.0%	7.8%	0.7x	19%	1.1x	90%	0.3%	22.0x	25.0x	0.5%	52 bps
Average	**22,405**	**34,865**	**0.6x**	**7.5%**	**10% #**	**11.5% #**	**3.1%**	**7.9%**	**0.7x**	**29%**	**90%**	**62%**	**0.4%**	**20.8x**	**25.0x**	**0.4%**	**49 bps**

Source: Author

8. Our views on Financial Equities going forward



Source: Author

8. European Equity Current and Forward Multiples: November 2011

	Market Consensus Valuation Metrics																	
	MBV	TBV	P/TBV	ROTE	P/BV	ROE				Implied ROTE	Implied ROE	P/E	Dividend Yield			EPS		
						YTD	2011	2012	2013				2011	2012	2013	2011	2012	2013
UK Banks																		
BARCLAYS	18,866	43,031	0.44x	7.0%	0.30x	4.8%	6.6%	7.8%	8.6%	5.7%	4.1%	6.3x	4.0%	5.0%	6.1%	0.28	0.33	0.40
HSBC	83,442	128,222	0.65x	14.4%	0.50x	11.0%	11.1%	11.4%	11.8%	5.3%	4.1%	4.5x	5.6%	6.3%	7.1%	0.91	0.99	1.13
LLOYDS	15,643	39,636	0.39x	-11.6%	0.34x	-10.1%	-1.9%	5.6%	8.3%	5.0%	4.4%	-3.4x	0.0%	2.2%	5.3%	0.02	0.04	0.07
RBS	19,643	60,152	0.33x	-4.7%	0.26x	-3.7%	-0.6%	3.8%	5.3%	4.2%	3.4%	-6.9x	0.0%	1.1%	2.8%	0.01	0.02	0.04
STANDARD	30,255	33,536	0.90x	15.3%	0.73x	12.3%	12.2%	12.6%	12.8%	8.3%	6.8%	5.9x						
Germany Banks																		
COMMERZBANK	6,448	18,417	0.35x	-14.9%	0.26x	-11.0%	3.7%	6.9%	8.6%	3.6%	2.8%	-2.3x	0.0%	2.4%	4.9%	0.16	0.31	0.41
DB	23,275	36,422	0.64x	8.0%	0.44x	5.5%	9.2%	9.2%	9.5%	6.4%	4.5%	8.0x	3.1%	3.2%	3.6%	4.99	5.30	5.94
Swiss Banks																		
CS	24,060	24,889	0.97x	11.0%	0.57x	6.4%	9.6%	11.5%	12.0%	8.8%	5.4%	8.8x	3.6%	3.8%	5.3%	2.43	3.23	3.77
UBS	38,704	42,425	0.91x	9.6%	0.69x	7.2%	9.3%	10.2%	11.2%	7.8%	6.0%	9.5x	1.0%	1.6%	3.8%	1.15	1.46	1.71
Dutch banks																		
ING	18,947	43,800	0.43x	15.5%	0.39x	14.0%	13.9%	11.1%	11.0%	5.7%	5.2%	2.8x	0.0%	5.3%	8.1%	1.47	1.36	1.47
KBC	3,070	7,727	0.40x	-81.7%	0.18x	-36.4%	8.3%	14.2%	14.2%	4.8%	2.4%	-0.5x	4.8%	7.3%	10.1%	2.95	4.49	4.98
SNS	412	2,390	0.17x	3.7%	0.09x	1.8%	5.3%	9.9%	4.3%	2.4%	1.4%	4.7x	0.0%	1.5%	18.1%	0.45	0.83	0.93
Spanish and Portuguese Banks																		
SANTANDER	45,338	46,711	0.97x	15.4%	0.58x	9.2%	9.9%	10.5%	11.0%	13.8%	8.4%	6.3x	11.0%	10.7%	11.1%	0.86	0.90	0.98
BANKIA	5,440	15,831	0.34x	2.3%	0.34x	2.2%	2.1%	2.6%	4.7%	5.2%	5.1%	15.1x	2.9%	3.9%	6.7%	0.21	0.26	0.46
CAIXA	13,479	19,846	0.68x	0.2%	0.64x	0.2%	6.0%	6.2%	7.7%	8.2%	7.8%	280.8x	6.4%	6.4%	6.8%	0.33	0.37	0.46
BBVA	27,600	28,070	0.98x	11.5%	0.69x	8.1%	10.8%	10.4%	11.0%	14.5%	10.3%	8.6x	7.3%	7.3%	7.8%	0.89	0.91	1.01
POPULAR SM	3,968	7,564	0.52x	5.2%	0.48x	4.7%	5.6%	5.0%	6.2%	7.2%	6.6%	10.1x	6.1%	5.9%	7.1%	0.30	0.28	0.38
BANESTO	2,406	5,570	0.43x	0.8%	0.43x	0.8%	6.6%	6.8%	7.8%	5.6%	5.6%	51.9x	7.3%	7.8%	9.3%	0.53	0.56	0.68
SABADELL	3,140	4,904	0.64x	3.5%	0.53x	2.9%	4.5%	4.5%	6.2%	7.6%	6.4%	18.2x	4.0%	4.2%	5.9%	0.18	0.20	0.27
BANKINTER	1,858	3,055	0.61x	6.1%	0.61x	6.1%	6.1%	6.4%	6.9%	8.3%	8.3%	9.9x	4.1%	4.5%	5.0%	0.33	0.36	0.42
PASTOR	764	1,682	0.45x	3.0%	0.44x	2.9%	3.2%	4.3%	4.5%	4.8%	4.7%	15.0x	2.1%	2.6%	3.2%	0.18	0.24	0.22
BCP	987	5,370	0.18x	-2.2%	0.14x	-1.6%	2.4%	1.7%	3.6%	3.6%	2.8%	-8.5x	2.9%	0.7%	5.1%	0.02	0.02	0.04
BES	1,359	5,638	0.24x	-1.3%	0.20x	-1.1%	4.9%	4.8%	6.2%	4.6%	3.9%	-18.7x	4.9%	3.7%	6.4%	0.22	0.21	0.31
BPI	430	841	0.51x	10.7%	0.32x	6.7%	9.9%	8.5%	8.8%	8.7%	5.6%	4.8x	1.4%	3.7%	7.6%	0.00	0.00	0.00
Italian Banks																		
UNICREDIT	13,780	36,730	0.38x	-115.9%	0.25x	-76.6%	-4.4%	4.0%	5.4%	6.1%	4.2%	-0.3x	0.0%	5.3%	7.8%	0.01	0.13	0.17
ISPM	18,440	57,554	0.32x	3.7%	0.31x	3.6%	4.0%	4.5%	5.4%	5.4%	5.3%	8.7x	6.3%	6.8%	7.9%	0.15	0.16	0.20
MONTE	2,951	7,578	0.39x	2.2%	0.18x	1.0%	2.1%	2.7%	3.9%	5.6%	2.8%	17.5x	4.7%	6.2%	8.6%	0.04	0.04	0.06
POPOLARE IM	1,543	6,674	0.23x	7.9%	0.13x	4.3%	2.7%	2.5%	3.6%	3.6%	2.2%	2.9x	3.4%	4.3%	5.9%	0.14	0.14	0.19
UBI	2,561	6,020	0.43x	-4.6%	0.21x	-2.3%	2.2%	2.2%	3.2%	5.9%	3.1%	-9.3x	3.7%	4.6%	6.4%	0.26	0.31	0.41
French Banks													0.0%	0.0%	0.0%	0.00	0.00	0.00
BNP	31,764	54,557	0.58x	4.0%	0.37x	2.5%	10.1%	10.1%	10.0%	7.5%	4.9%	14.7x	6.0%	6.7%	7.3%	5.81	6.18	6.54
CASA	10,294	27,400	0.38x	3.8%	0.19x	2.0%	5.5%	7.1%	7.6%	5.3%	3.0%	10.0x	9.1%	10.9%	12.0%	1.09	1.36	1.52
NATIXIS	5,582	16,046	0.35x	8.6%	0.27x	6.6%	7.9%	7.3%	7.5%	4.3%	3.4%	4.1x	10.1%	10.3%	11.2%	0.45	0.43	0.46
SG	12,247	41,800	0.29x	6.0%	0.23x	4.7%	7.1%	8.1%	8.2%	4.7%	3.8%	4.9x	0.0%	8.9%	10.1%	3.99	4.60	5.16
BPCE																		
Average ex Greece /Nordic/EE	**488,696**	**880,088**	**0.5x**	**-1.8%**	**0.4x**	**-0.3%**	**5.9%**	**7.1%**	**7.8%**	**6.3%**	**4.8%**	**14.7x**	**3.8%**	**5.0%**	**7.1%**	**0.93**	**1.09**	**1.24**
MW Average ex Greece/Nordic/ EE			**0.7x**	**4.4%**	**0.5x**	**3.5%**	**8.1%**	**9.1%**	**9.8%**	**7.4%**	**5.5%**	**13.8x**	**4.3%**	**5.4%**	**6.6%**	**1.36**	**1.51**	**1.69**

US Equity Current and Forward Multiples: November 2011

	Market Consensus Valuation Metrics																	
	MBV	TBV	P/TBV	ROTE	P/BV	ROE				Implied ROTE	Implied ROE	P/E	Dividend Yield			EPS		
						YTD	2011	2012	2013				2011	2012	2013	2011	2012	2013
US Brokers																		
GS	44,885	61,529	0.7x	-2.6%	0.63x	-2.2%	9.6%	11.5%	12.0%	7.6%	6.7%	-28.6x	3.6%	3.8%	5.3%	2.43	3.23	3.77
MS	25,114	49,241	0.5x	17.9%	0.36x	12.5%	9.3%	10.2%	11.2%	5.4%	4.1%	2.9x	1.0%	1.6%	3.8%	1.15	1.46	1.71
US Large Caps																		
BAC	52,098	131,176	0.4x	19.0%	0.23x	10.8%	9.9%	10.5%	11.0%	4.4%	2.9%	2.1x	11.0%	10.7%	11.1%	0.86	0.90	0.98
BK	21,585	10,270	2.1x	25.4%	0.63x	7.5%	2.1%	2.6%	4.7%	8.6%	3.3%	8.3x	2.9%	3.9%	6.7%	0.21	0.26	0.46
C	68,736	144,764	0.5x	10.4%	0.38x	8.4%	6.0%	6.2%	7.7%	3.9%	3.4%	4.6x	6.4%	6.4%	6.8%	0.33	0.37	0.46
JPM	107,837	122,911	0.9x	13.9%	0.59x	9.4%	10.8%	10.4%	11.0%	8.9%	6.3%	6.3x	7.3%	7.3%	7.8%	0.89	0.91	1.01
PNC	25,716	22,427	1.1x	14.8%	0.69x	8.9%	5.6%	5.0%	6.2%	9.7%	6.2%	7.7x	6.1%	5.9%	7.1%	0.30	0.28	0.38
USB	45,401	20,482	2.2x	24.9%	1.33x	14.9%	6.6%	6.8%	7.8%	15.9%	9.9%	8.9x	7.3%	7.8%	9.3%	0.53	0.56	0.68
WFC	122,399	91,754	1.3x	17.7%	0.88x	11.6%	4.5%	4.5%	6.2%	8.9%	6.2%	7.5x	4.0%	4.2%	5.9%	0.18	0.20	0.27
Aussie Banks																		
NAB	49,027	32,334	1.5x	17.3%	1.16x	13.2%	-4.4%	4.0%	5.4%	18.1%	14.1%	8.8x	0.0%	5.3%	7.8%	0.01	0.13	0.17
ANZ	50,087	30,071	1.7x	17.9%	1.32x	14.2%	4.0%	4.5%	5.4%	20.6%	16.5%	9.3x	6.3%	6.8%	7.9%	0.15	0.16	0.20
CBA	73,453	27,156	2.7x	24.6%	1.97x	17.9%	2.1%	2.7%	3.9%	26.4%	19.5%	11.0x	4.7%	6.2%	8.6%	0.04	0.04	0.06
MQG	7,643	9,858	0.8x	6.2%	0.65x	5.2%	2.7%	2.5%	3.6%	8.6%	7.3%	12.5x	3.4%	4.3%	5.9%	0.14	0.14	0.19
WBC	59,857	30,047	2.0x	20.2%	1.37x	13.8%	2.2%	2.2%	3.2%	19.0%	13.3%	9.9x	3.7%	4.6%	6.4%	0.26	0.31	0.41
Average US only	**513,771**	**654,554**	**1.1x**	**15.7%**	**0.6x**	**9.1%**	**7.2%**	**7.5%**	**8.6%**	**8.2%**	**5.5%**	**2.2x**	**5.5%**	**5.7%**	**7.1%**	**0.76**	**0.91**	**1.08**
MW Average US only			**$1.04**	**15.1%**	**0.7x**	**9.5%**	**7.4%**	**7.6%**	**8.7%**	**8.2%**	**5.7%**	**3.1x**	**5.9%**	**6.0%**	**7.2%**	**0.70**	**0.81**	**0.95**

Source: Author

European Implied ROE and COE for European banks: November 2011

						ROE / P/B Analysis											
Bank	Market cap	Equity	Q3 P/BV	Q3 ROE	Consensus 2013 ROTE target	COE						Perp G Rate	Market Implied ROE	Q2 Implied P/B	Premium/ (Discount)	2012 Implied P/B	Premium/ (Discount)
UK Banks						Country RFA	Country 5 yt CDS	Beta	ERP	COE (rfa)	COE (German y0						
BARCLAYS	18,866	61,989	0.3x	4.8%	9%	2.03%	100	1.73	6.00%	12.4%	13.5%	1.0%	4.8%	0.4x	17%	0.6x	101%
HSBC	83,442	167,537	0.5x	11.0%	12%	2.03%	100	0.96	6.00%	7.8%	8.9%	1.0%	4.9%	0.6x	11%	1.4x	175%
LLOYDS	15,643	45,546	0.3x	-10.1%	8%	2.03%	100	1.65	6.00%	11.9%	13.0%	1.0%	5.1%	0.4x	15%	0.6x	76%
RBS	19,643	76,242	0.3x	-3.7%	5%	2.03%	100	1.62	6.00%	11.7%	12.8%	1.0%	4.0%	0.3x	23%	0.4x	40%
STANDARD	30,255	41,561	0.7x	12.3%	13%	2.03%	100	1.18	6.00%	9.1%	10.2%	1.0%	7.7%	0.8x	4%	1.3x	76%
Germany Banks																	
COMMERZBANK	6,448	24,869	0.3x	-11.0%	9%	2.08%	110	1.20	6.00%	9.3%	9.3%	1.0%	3.1%	0.3x	31%	0.9x	253%
DB	23,275	53,108	0.4x	5.5%	10%	2.08%	110	1.27	6.00%	9.7%	9.7%	1.0%	4.8%	0.5x	13%	1.0x	124%
Swiss Banks																	
CS	24,060	42,478	0.6x	6.4%	12%	0.84%	52	1.37	6.00%	9.1%	9.1%	1.0%	5.6%	0.6x	8%	1.4x	141%
UBS	38,704	56,276	0.7x	7.2%	11%	0.84%	52	1.28	6.00%	8.5%	8.5%	1.0%	6.2%	0.7x	5%	1.4x	97%
Dutch banks																	
ING	18,947	48,276	0.4x	14.0%	11%	2.68%	128	1.63	6.00%	12.5%	13.2%	1.0%	5.8%	0.4x	12%	0.8x	110%
KBC	3,070	17,351	0.2x	-36.4%	14%	2.68%	128	1.43	6.00%	11.3%	12.0%	1.0%	2.9%	0.2x	39%	1.2x	581%
SNS	412	4,833	0.1x	1.8%	4%	2.68%	128	1.47	6.00%	11.5%	12.2%	1.0%	2.0%	0.2x	88%	0.3x	243%
Spanish and Portuguese Banks																	
SANTANDER	45,338	78,289	0.6x	9.2%	11%	6.55%	491	1.28	6.00%	14.2%	14.7%	1.0%	8.9%	0.6x	5%	0.7x	27%
BANKIA	5,440	16,140	0.3x	2.2%	5%	6.55%	491	1.28	6.00%	14.2%	14.7%	1.0%	5.6%	0.4x	13%	0.3x	(21%)
CAIXA	13,479	20,973	0.6x	0.2%	8%	6.55%	491	0.88	6.00%	11.8%	12.3%	1.0%	8.2%	0.7x	5%	0.6x	(8%)
BBVA	27,600	39,868	0.7x	8.1%	11%	6.55%	491	1.36	6.00%	14.7%	15.2%	1.0%	10.8%	0.7x	3%	0.7x	2%
POPULAR SM	3,968	8,320	0.5x	4.7%	6%	6.55%	491	1.12	6.00%	13.3%	13.7%	1.0%	7.1%	0.5x	8%	0.4x	(14%)
BANESTO	2,406	5,638	0.4x	0.8%	8%	6.55%	491	0.97	6.00%	12.4%	12.8%	1.0%	6.1%	0.5x	10%	0.6x	34%
SABADELL	3,140	5,944	0.5x	2.9%	6%	6.55%	491	0.85	6.00%	11.6%	12.1%	1.0%	6.9%	0.6x	7%	0.5x	(11%)
BANKINTER	1,858	3,055	0.6x	6.1%	7%	6.55%	491	1.13	6.00%	13.3%	13.8%	1.0%	8.8%	0.6x	5%	0.5x	(24%)
PASTOR	764	1,882	0.4x	2.7%	5%	6.55%	491	0.56	6.00%	9.9%	10.4%	1.0%	4.8%	0.5x	14%	0.4x	(8%)
BCP	987	7,295	0.1x	-1.6%	4%	11.74%	1,082	0.95	6.00%	17.5%	18.6%	1.0%	3.4%	0.2x	34%	0.1x	10%
BES	1,359	6,904	0.2x	-1.1%	6%	11.74%	1,082	0.99	6.00%	17.7%	18.8%	1.0%	4.5%	0.2x	22%	0.3x	49%
BPI	430	1,347	0.3x	6.7%	9%	11.74%	1,082	0.80	6.00%	16.5%	17.7%	1.0%	6.3%	0.4x	12%	0.5x	47%
Italian Banks																	
UNICREDIT	13,780	55,564	0.2x	-76.6%	5%	6.99%	562	1.40	6.00%	15.4%	16.1%	1.0%	4.7%	0.3x	19%	0.3x	19%
ISPM	18,440	58,626	0.3x	3.6%	5%	6.99%	562	1.48	6.00%	15.9%	16.6%	1.0%	5.9%	0.4x	13%	0.3x	(11%)
MONTE	2,951	16,767	0.2x	1.0%	4%	6.99%	562	1.09	6.00%	13.5%	14.2%	1.0%	3.3%	0.2x	33%	0.2x	26%
POPOLARE IM	1,543	12,201	0.1x	4.3%	4%	6.99%	562	1.15	6.00%	13.9%	14.6%	1.0%	2.7%	0.2x	47%	0.2x	50%
UBI	2,561	12,237	0.2x	-2.3%	3%	6.99%	562	1.03	6.00%	13.2%	13.9%	1.0%	3.7%	0.3x	27%	0.2x	(19%)
French Banks																	
BNP	31,764	86,676	0.4x	2.5%	10%	3.70%	250	1.48	6.00%	12.6%	13.4%	1.0%	5.6%	0.4x	13%	0.7x	98%
CASA	10,294	52,800	0.2x	2.0%	8%	3.70%	250	1.58	6.00%	13.2%	14.1%	1.0%	3.5%	0.3x	29%	0.5x	161%
NATIXIS	5,582	20,997	0.3x	6.6%	8%	3.70%	250	1.30	6.00%	11.5%	12.4%	1.0%	4.0%	0.3x	22%	0.6x	115%
SG	12,247	52,600	0.2x	4.7%	8%	3.70%	250	1.85	6.00%	14.8%	15.7%	1.0%	4.4%	0.3x	21%	0.5x	110%
BPCE																	
Average ex Greece and EE	**488,696**	**1,204,189**	**0.4x**	**-0.3%**	**8% #**	**5.09%**	**384**	**1.3**	**6.00%**	**12.6%**	**13.3% #**	**1.0%**	**5.3%**	**0.42x**	**19%**	**0.6x**	**80%**
MW Average ex Greece and EE			**0.5x**	**3.5%**	**10% #**	**3.53%**	**240**	**1.3**	**6.00%**	**11.4%**	**12.0% #**	**1.0%**	**6.0%**	**0.52x**	**12%**	**0.9x**	**91%**

Source: Author

US Implied ROE and COE for European banks: November 2011

Bank	Market cap	Equity	Q3 P/BV	Q3 ROE	Consensus 2013 ROTE target	COE						Perp G Rate	Market Implied ROE	Q2 Implied P/B	Premium/ (Discount)	2012 Implied P/B	Premium/ (Discount)
												ROE / P/B Analysis					
						Country RFA	Country 5 yt CDS	Beta	ERP	COE (rfa)	COE (US)						
US Brokers																	
GS	44,885	71,563	0.6x	-2.2%	12%	1.87%	56	1.37	6.00%	10.1%	10.1%	1.0%	6.7%	0.7x	**6%**	1.2x	**93%**
MS	25,114	70,094	0.4x	12.5%	11%	1.87%	56	1.28	6.00%	9.6%	9.6%	1.0%	4.1%	0.4x	**19%**	1.2x	**232%**
US Large Caps																	
BAC	52,098	230,252	0.2x	10.8%	11%	1.87%	56	1.28	6.00%	9.5%	9.5%	1.0%	2.9%	0.3x	**36%**	1.2x	**418%**
BK	21,585	34,529	0.6x	7.5%	5%	1.87%	56	0.46	6.00%	4.6%	4.6%	1.0%	3.3%	0.7x	**13%**	1.0x	**62%**
C	68,736	179,342	0.4x	8.4%	8%	1.87%	56	0.88	6.00%	7.1%	7.1%	1.0%	3.4%	0.5x	**23%**	1.1x	**184%**
JPM	107,837	182,287	0.6x	9.4%	11%	1.87%	56	1.36	6.00%	10.0%	10.0%	1.0%	6.3%	0.6x	**7%**	1.1x	**86%**
PNC	25,716	37,242	0.7x	8.9%	6%	1.87%	56	1.12	6.00%	8.6%	8.6%	1.0%	6.2%	0.7x	**5%**	0.7x	**(0%)**
USB	45,401	34,210	1.3x	14.9%	8%	1.87%	56	0.97	6.00%	7.7%	7.7%	1.0%	9.9%	1.3x	**(3%)**	1.0x	**(24%)**
WFC	122,399	139,244	0.9x	11.6%	6%	1.87%	56	0.85	6.00%	7.0%	7.0%	1.0%	6.2%	0.9x	**2%**	0.9x	**0%**
Average US only	**753,838**	**1,151,764**	**0.6x**	**9.1%**	**9% #**	**1.87%**	**56**	**1.06**	**6.00%**	**8.3%**	**8.3% #**	**1.0%**	**5.5%**	**0.7x**	**12%**	**1.0x**	**117%**
MW Average US only			**0.7x**	**9.5%**	**9% #**	**1.87%**	**56**	**1.08**	**6.00%**	**8.3%**	**8.3% #**	**1.0%**	**5.7%**	**0.7x**	**11%**	**1.0x**	**105%**

Source:Author

FINAL REMARKS

The outcome of the two empirical projects perfectly matches the conclusions of our theoretical framework.

In the first part, US companies seem to command a lower WACC on a pre and post restructuring basis owing to the effectiveness of the Chapter 11 to enable the company's rehabilitation that boosts the expected recovery for all security holders as well as preserving the company's value. The effective tools of Chapter 11 (with a proven track record given the number of successful restructurings relative to Western Europe bankruptcy proceedings) aim to protect the company while looking after the rights of the different stakeholders in the firm. Furthermore, only strong companies with a sound capital structure and a viable business plan emerge from Chapter 11. Therefore, our initial theoretical support of Chapter 11 as the most efficient restructuring framework finds the necessary empirical validation in our model even though the difference is not as significant as presumed given the theoretical underpinning. This could be due to the limitations of our model in terms of size, assumptions or lack of market data that might create some statistical biases. Nonetheless, we are quite confident about the findings and we hope they can support further studies of our pioneering work on the new "distressed" WACC role.

In the second part, our empirical model further champions the theoretical backdrop that underpins the empirical model at the end. Our model shows the incremental pick-up in WACC between Basel II and III as expected due to the new implementation of loss absorbing instruments plus higher common equity requirements. However, if we assume an extreme scenario where a bank's solvency ratio illustrated by CT1 falls below a threshold that triggers the CoCo conversion into equity, the post conversion WACC creeps up but not meaningfully due to the highly initial cost of capital under Basel III. What does it mean for banks? Banks cannot escape from the new loss absorbing capital structure which will push the overall WACC up. This is a given. However, banks will have to mitigate it via three ways:(1) comply with the minimum solvency ratios and resort to secured debt (covered bonds and deposits) au lieu of senior debt (mostly if "bail-in" hits the senior debt) which we expect to reprice up; (2) manage the capital structure according to their COE; low beta names will command low COEs and therefore will favor equity versus CoCos if COE is lower than CoCos' coupons; (3) banks could issue CoCos with both downside (loss absorbing features) and upside (convertible features) features to bring down the overall cost of capital (4) Deleverage away from high capital intensive businesses (but also high ROEs ones) to reduce the RWA and free up capital. .

We are confident that we are meaningfully contributing to the theoretical and empirical literature on the WACC, more particularly what we call "Distressed" WACC. The WACC not only as a capital structure cost guideline but done on a market basis, provides so much information about the current and future state of the corporate / bank.

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